



Highlights from Corona Immunitas

A Switzerland-wide research program on SARS-CoV-2

SSPH+ online Faculty Meeting, June 17 2020

The Corona Immunitas Team





Why viral detection (PCR) alone is not enough to determine the spread







Immune response as prove of infection







Surveillance using serological (antibody) studies – main questions

- How many of a population has been infected by SARS-CoV-2?
- How many persons with SARS-CoV-2 infection illness have or little symptoms?
- Is an infection associated with immunity? Factors associated with (partial) immunity?
- How is the spread changing over time?
- How do protective measures impact on the spread of SARS-CoV-2 infections?

See also https://www.cdc.gov/coronavirus/2019-ncov/covid-data/serology-surveillance/index.html





Rapid review of serological studies worldwide (so far)



Bobrovitz et al May 14 2020 ; https://www.medrxiv.org/content/10.1101/2020.05.10.20097451v1





Estimates and limitations of serological studies worldwide (so far)

Region	Test Characteristics	Sampling frame and method	N	Seropositive Prevalence ^a	Total Cases/ 1M	Risk of Bias ^b
					Pop.	
Ongoing Study	:				1	1
Chelsea, US	LFIA (88.7%, 90.6%)	General pop.: convenience	200	31.5%	6,287	High
Brevard County, US	LFIA (100%, 100%)	RT-PCR-tested: self-referred	1,000	1%	1,133	High
New York State, US	NR	Supermarket shoppers: convenience	7,500	14.9%	14,985	Unclear
New York City, US	NR	Supermarket shoppers: convenience	NR	24.7%	14,985	Unclear
Westchester/Rockland, US	NR	Supermarket shoppers: convenience	NR	15.1%	14,985	Unclear
Long Island, US	NR	Supermarket shoppers: convenience	NR	14.4%	14,985	Unclear
New York upstate, US	NR	Supermarket shoppers: convenience	NR	3.2%	14,985	Unclear
Idaho, US	NR	Patients: self-referred	1,946	1.8%	1,046	Moderate
Miami, US	Immunochromatography (88.7%, 90.6%)	General pop.: random	NR	6% (4.4-7.9%)	1,439	Unclear
San Miguel County, US	NR	General pop.: entire population	986	0.8%	1,121	High
Lebanon/Claremont, US	NR	Healthcare workers: self-referred	47	2%	1,442	Unclear
Completed Study						
Denmark	LFIA (83%, 100%)	Blood donors: sequential	9,496	1.7% (0.9-2.3%)	754	Moderate
Oise, France	ELISA, S-FLOW, LIPS (~, 99%)	Teachers: cluster-based	53	43.4%	615	High
		Parents: cluster-based	211	11.4%	615	High
		Students' siblings: cluster-based	127	10.2%	615	High
		Students: cluster-based	240	38.3%	615	High
		Non-teacher staff: cluster-based	27	59.3%	615	High
Paris/Oise, France	ELISA, S-FLOW, LIPS	Blood donors: unclear	200	3%	168	High
Gangelt, Germany	NR	General pop.: unclear	500	14%	1,352	High
	DDT	0 1 1	551	210((11.200))	1.004	771 1

- Mostly cross-sectional surveys
- No estimates at low risk of bias
- Inadequate sampling methods (mostly convenience samples)
- Unclear antibody test performance
- Lack of coordinated efforts → test fatigue and patchwork
- Lack of additional information (symptoms, risk factors, behavior, etc)

Bobrovitz et al May 14 2020 ; <u>https://www.medrxiv.org/content/10.1101/2020.05.10.20097451v1</u>





Corona Immunitas – a compass for Switzerland



- Provides a consistent picture of the spread of SARS-CoV-2 across Switzerland
- Thanks to a standardized protocol
- And carefully developed antibody testing strategy
- Longitudinal !
- Aims at strengthening public health research in Switzerland













Corona Immunitas - phases







Corona Immunitas studies











Week 1

Week 2

Week 3

Week 5

Week 6

Week 8

Week 9

Week 10









Vaud













category	N		Participation		
Index cases		181	39.4		
close contacts - households		244			
close contats - outside		56	47.9		
FSO		653	24.6		
Migros		92	38.3		
Public transport		83	39.7		
La Poste		94	30.3		
Asylum seekers		124	30.8		
Blanchisseries Generales SA		63	25.7		









Objectives of our study

1) Analyse the COVID epidemic from a socio-demographic perspective

2) Between 15.02.2020 and 01.05.2020 and depending on the measures taken by the authorities, assess:

- among those listed as "probable cases" (2500)
 - The positivity rate (10 % in the beginning? 30 % 70 % At epidemic peak?)
- among the positive people (700 + X of 2500)
 - The proportion of transmission of Covid-19 in different areas (travel, work, family, leisure...)
 - Acceptance of sanitary measures (isolation, social distancing, hygiene measures...)
 - The degree of risk awareness
- 3) Assess the risk of transmission within the professional area
 - a. depending on the field of activity
 - b. based on physical interactions

4) Create a cantonal serotheque of Sars-Cov-2 positive cases







Corona Immunitas - Fribourg: Team

Population Health Laboratory - #PopHealthLab

- Dr Arnaud Chiolero, MD PhD, prof of public health
- Dr Stephane Cullati, PhD, senior lecturer epidemiology & public health

UNI

FR

- Dr Adina Epure, MD, and Daniela Anker, MSc, PhD students
- Catherine Girard, Daniel Maric Aebi, Lucille Fragnière, administrative staff

Institute of Family Medicine

Dr Pierre-Yves Rodondi, MD, prof of primary health care

Websites:

- #PopHealthLab: <u>https://www3.unifr.ch/med/de/research/groups/pophealthlab/</u>
- Corona Immunitas Fribourg: <u>https://www3.unifr.ch/med/imf/fr/news/covid19/corona-immunitas/</u>

#Pop Health Lab



Fribourg



Corona Immunitas - Fribourg: Study design

Study design

Cross-sectional seroprevalence study with 2 recruitment phases

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Optional: digital cohort

Population

#Pop

Lab

Health

- Population-based samples of 600 individuals per phase
 - 300 aged 20-64 yrs
 - 300 aged 65+ yrs (no kids)
- Volunteers welcome (max 200 in each phase)

Data collection

- Baseline questionnaire: online or paper form
- Blood sample collection: at 5 sites of cantonal hospital or at home

Serological analyses

Laboratory: cantonal hospital Fribourg

Calendar

- Recruitment start: Jun 15th and Sep 15th
- Results expected: Aug and Nov (governmental report)





Scuola universitaria professionale della Svizzera italiana



Institute of Public Health (IPH), Università della Svizzera italiana (USI)

- Prof. Dr. Emiliano Albanese Project leader
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Scuola universitaria professionale della Svizzera italiana

SUPSI



Research program in Ticino: General population, health workers, nursing homes











CoV-Co Basel







Corona Immunitas nested into CoV-Co Basel

Corona Immunitas Objectives

equally sized population-based samples BS and BL – adults 18-65+ -

children and adolescents recruited from within households of adult index participants with a additional focus on family/household environment

CoV-Co-Basel Objectives

long-term impact of epidemic and its containment measures on various domains of behavior, life circumstances, health and wellbeing of individuals and families/households Reference for comparative studies in low- and middle-income countries (i.e. Ethiopia; Kosovo; Palestine)







Populations and visits

Comparison of special groups with general pop

Quite some focus on how antibodies develop over time











1st school visit (~ 2500 children) Blood sample, sputum, questionnaire **2nd school visit** (~ 2500 children) Blood sample, sputum, questionnaire **3rd school visit** (~ 2500 children) Blood sample, sputum, questionnaire







Supporters – public und private



Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzerä Confederazion svizra

Bundesamt für Gesundheit (BAG)



Kanton Zürich Gesundheitsdirektion ZÜRCHER HANDELSKAMMER









Political advisory board



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https://www.corona-immunitas.ch/politics





Testimonials



Doris Leuthard



Ruth Dreifuss



Ursula Zybach



Felix Gutzwiler

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