

SARS-COV-2 re-infection risk in Austria, 2021

Authors

1. Sophie Alice Müller, Centre for International Health Protection, Robert Koch Institute
2. Seth Kofi Abrokwa, Evidence-Based Public Health, Centre for International Health Protection, Robert Koch Institute
3. Charbel El Bcheraoui, Evidence-Based Public Health, Centre for International Health Protection, Robert Koch Institute

Public health question

How effective and long lasting is immunity against COVID-19 in individuals who were previously infected with SARS-CoV-2?

Evaluation of the risk of SARS-CoV-2 re-infections in the general population in Austria.

Interventions

Protection against SARS-COV-2 during the second COVID-19 wave due to history of infection during the first wave.

Publication status of included studies

Accepted manuscript in European Journal of Clinical Investigation (2017 IF of 3.1).

Data

Empirical research

Quality assessment process

[*Checklist for Cohort Studies*](https://jbi.global/sites/default/files/2020-10/Checklist_for_Cohort_Studies.pdf) *Critical Appraisal tools for use in JBI Systematic Reviews*

1. Were the two groups similar and recruited from the same population?

Both are from the general Austrian population

🡪 yes

2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?

In this case, exposure equals first infection. Infection was assessed by PCR.

Group 1 (COVID-19 survivors) only includes positive tested, Group 2 (general population) includes non-tested and negative tested Austrians.

Non-tested potential asymptomatic cases are included in Group 2

🡪 yes

3. Was the exposure measured in a valid and reliable way?

PCR test, no further information

🡪 yes

4. Were confounding factors identified?

Epidemiological characteristics of re-infected are described in Table 1, no epidemiological characteristics are described for people with one infection only, no prognostic factors or concomitant exposures are given

No confounding factors identified

🡪 unclear

5. Were strategies to deal with confounding factors stated?

🡪 NA

6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?

Outcome of interest is tentative reinfection in second wave. Tentative reinfections before the second wave are not included, as the author state they are most likely prolong viral shedding.

🡪 yes

7. Were the outcomes measured in a valid and reliable way?

PCR testing without genome sequencing, but epidemiological case definition with >4 months between the two episodes.

🡪 yes

8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?

Time between first and second wave (>4 months) was included

🡪 yes

9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?

Data from national surveillance system, follow-up is complete, deaths among first wave are considered.

🡪 yes

10. Were strategies to address incomplete follow up utilized?

There is no loss to follow-up since identifiers are given to every infected and these identifiers can be linked in different episodes

🡪 yes

11. Was appropriate statistical analysis used?

Only univariate OR calculation, no assessment of confounders, no adjustment for untested asymptomatic cases

🡪 unclear

Using this appraisal tool, 8 of the 11 criteria were met.

Additional points from <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>

1. Was the research question or objective in this paper clearly stated?

How effective and long lasting is immunity against COVID-19 in individuals who were previously infected with SARS-CoV-2?

🡪 yes

1. Was the participation rate of eligible persons at least 50%?

Number of negative tested not specified

🡪 unclear

1. Was a sample size justification, power description, or variance and effect estimates provided?

No sample size calculation applied, as whole population was included

🡪 unclear

1. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?

🡪 yes

1. Were the outcome assessors blinded to the exposure status of participants?

🡪 No

Results

Strengths:

* comprehensive study including data on 14.840 infected in first wave and 253,581 in second wave.
* Re-infection defined as re-positive after 6 months, prolong viral shedding unlikely

Weaknesses:

* No data on genome sequencing
* No baseline characteristics of infected people from first wave, no assessment of change in behavior
* No routine testing, underestimation possible
* No data on negative tests performed.

Conclusions

This study reports protection against SARS-CoV-2 after natural infection comparable to protection after vaccination. This evidence does not take into account the potential underestimation without routine testing or behavioral change after first infection. It can therefore only be used as addtional evidence to decide on public health measures and vaccination strategies.

Suggested citation

Müller SA, Abrokwa SK, El Bcheraoui C. Robert Koch Institute. Report: Assessment of a peer-reviewed epidemiological study: SARS-CoV-2 re-infection risk in Austria, 2021, Berlin 2021

The Robert Koch Institute is a Federal Institute   
within the Portfolio of the Federal Ministry of Health