

## Peer Review Report

# Review Report on Changes in healthcare utilization during the COVID-19 pandemic and potential causes – A cohort study from Switzerland

Original Article, Int J Public Health

Reviewer: Daniel Ludecke

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### EVALUATION

#### **Q 1** Please summarize the main findings of the study.

The study aimed at investigating change in healthcare utilization for people in need of regular treatment during the COVID pandemic. Certain chronic conditions, partly fear of COVID, and female gender seem to be predictors for a lower health care utilization.

#### **Q 2** Please highlight the limitations and strengths.

Strengths are the large sample, the longitudinal design and the many measures obtained. Limitations might be the clarity of the study aims and how the reported results match the objectives of this paper.

#### **Q 3** Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

##### Introduction

- The introduction is well written and concise.

##### Methods

- Study population, lines 75ff.: The sampling procedure lacks some details. It's not clear how people were contacted (via telephone, from registers, ...) and how many were initially contacted (i.e. response rate). The results section says that 51% completed at least one questionnaire, but how many have been contacted and what proportion (response rate) are the finally included 6252 individuals? Please provide some more issues on these details.
- Measurements: This section could be clearer. What are the main outcomes related to the research question? One outcome, "reasons for changes", is just described in one sentence. The presentation of the results in Fig. 2 suggests that reasons were recoded into some kind of "keyword", but it's not very clear. Furthermore, it remains unclear how forgone care or treatments are measured for the group without the need for regular treatment? How was "change in healthcare utilization" measured in that group? This is crucial, as it is not very clear which group was included in the regression model? I think only those with ongoing treatment, but I'm not definitely sure.
- Measurements: Please provide a short description, or at least an enumeration of covariates used. More information is needed on how income, education or chronic conditions are measured.
- Data analysis, lines 115/116: The authors write "Due to differing answer possibilities" - This is not clear to me. In the measurement-section, no discrepancies in the answer-options to this question were mentioned. Please clarify.

- Data analysis: I would probably first mention the comparison of fear-groups (lines 117-118), then report the regression model (114-115).

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- Data analysis: What's the rationale behind using a zero-inflated negative binomial model? This is usually a model for count data, not for binary outcomes. The section "measurements" suggests that "change in health care" was dichotomized. Please describe in more details which outcome was used for the regression model and why the zero-inflated negative binomial was an appropriate choice. I know count models (Poisson regression) can be used for dichotomized outcomes to "pseudo-"model risk ratios instead of odds ratios. If this was a similar intention here, please provide references that showed similar uses of zero-inflated neg. binomial regression for binary outcomes, and if so, maybe the labels should be "risk ratios", not "incidence rate ratios" (only given when no incidence were measured with the outcome).

- Data analysis: The authors write that they collected longitudinal data. That required statistical approaches that can deal with such kind of data and problems that occur due to such data (auto-correlation from repeated measurement, for instance). A mixed (multilevel) model could be used to address such issues.

## Results

- The authors write "Those, who reported a change in healthcare utilization differed from those who did not" (lines 135-137), this is only partly true. There were many more characteristics where respondents differed, these differences were just not statistically significant. Please rephrase results to emphasize that you're mentioning statistically significant differences only.

- Figure 2 (word cloud) is not very clear, because it's not obvious which "word" is just one word, or consists of more words (like "pulmonary embolism"). Also, what is "bdecame"? Furthermore, the figure mentions "medication", while answers seem to were "adaptation/control of medication". While it may be easier to guess the context here, this is maybe not automatically true for other words from fig. 2. Maybe the authors should think about replacing the word cloud with a table, where labels are a bit longer and more intuitive.

- Figure 3, type of consultation: It's not clear why these results are presented. For me, this doesn't seem to be related to the research questions put in the introduction.

- Figure 4, fear of infection: Same here. The research questions focus on reasons/characteristics for "change". "Fear" seems to be a predictor, not an outcome. Again, why are these results presented?

- Figure 5: As IRRs are presented, the authors may think about using a log-transformed scale for the x-axis, since confidence intervals are not symmetric on a regular scale. Furthermore, and related to a previous comment, "change in healthcare" suggests being a yes/no outcome. Where to the incidences from the IRRs refer to?

- Why do authors include study site as predictor? I would consider this as a classical higher level characteristic, which could be used as cluster/group factor (random effect) in a mixed (multilevel) model. That would be possible be a more appropriate approach when regional differences should be taken into account.

## Discussion:

- Authors write "However, our results do not confirm the associations between stay-at-home recommendations and reduced utilization of healthcare services found previously" (lines 175-176): Why should this study confirm this association? Would this have been a possible answer to the open question for reasons why health care utilization was stopped? I don't see where a systematic assessment of such reason was conducted that would allow the confirmation of such results. Maybe stay-at-home recommendation was also a reason for changes in utilization, but just not mentioned, because respondent were thinking of other reasons first, depending on how the questionnaire was framed? Furthermore, as authors mentioned that "complete lockdown did not occur" in Switzerland, was "stay at home" a reasonable answer to that open question at all? I think this statement in the discussion should be revised.

- I'm not sure if I understood correctly, but results from the regression model indicate that "hypertension were least likely to report a change" (line 151), but the discussion mentions "reasons for change in healthcare utilization were reported as mainly medication-related in the German speaking area, especially for blood pressure treatment" (lines 158/159). How do authors explain this contradiction? This might be due to different numbers of respondents. Therefore, I suggest authors should add N's to the other figures and tables as well, so readers can see to which (sub-)sample size the results refer to.

- I'm missing some interpretation of the finding as why higher education was associated with higher probabilities of changes in health care, while higher income was associated with lower probability of change? I would expect that people with higher education often also belong to higher income groups, thus there could be a (somewhat higher) correlation between high education and high income. Findings in this study seem to contradict this intuition.

- Strengths and Limitations: See comments above, a clear limitation is the lack of multilevel modelling approaches may result in more "biased" coefficients when there could be regional variation in the data (i.e. it is collected from different sites) and auto-correlation due to repeated measurements.

#### PLEASE COMMENT

**Q 4** Is the title appropriate, concise, attractive?

Yes

**Q 5** Are the keywords appropriate?

Yes

**Q 6** Is the English language of sufficient quality?

Yes

**Q 7** Is the quality of the figures and tables satisfactory?

No.

**Q 8** Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes

#### QUALITY ASSESSMENT

**Q 9** Originality



**Q 10** Rigor



**Q 11** Significance to the field



**Q 12** Interest to a general audience



**Q 13** Quality of the writing



**Q 14** Overall scientific quality of the study



REVISION LEVEL

**Q 15** Please make a recommendation based on your comments:

Major revisions.