Peer Review Report

Review Report on Gender/Sex Disparities in the COVID-19 Cascade from Testing to Mortality: An Intersectional Analysis of Swiss Surveillance Data
Original Article, Int J Public Health

EVALUATION

Q 1   Please summarize the main findings of the study.

The study investigates gender/sex disparities in the epidemiological cascade for COVID-19 for the Vaud Canton in Switzerland. Results show that women contributed to a higher number of COVID-19 tests and positive tests than men, whereas more hospitalizations, ICU admissions, and deaths occurred among men. The analyses further revealed that disparities in testing and test positivity were similar for women and men when living in neighborhoods with comparable socioeconomic backgrounds. For COVID-19 mortality, pronounced gender/sex disparities across SEP quintiles were apparent suggesting an intricate interaction between socioeconomic factors and gender/sex in the trajectory of COVID-19.

Q 2   Please highlight the limitations and strengths.

Strenghts
+ Scientifically and societal relevant topic
+Clear and concise theoretical overview
+ Well-written and structured
+ Well-designed and executed research with many (many!) analyses performed to investigate the research questions
+ High-quality population data
+ Intersectional approach
+ Epidemiological cascade for COVID-19

Limitations
–Gender and sex are thrown into a mixed concept because of data limitations
–No mention of potential differences over time during the pandemic
–No individual-level information available to investigate SEP
–Little context on the Canton of Vaud within Switzerland

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.

MINOR COMMENTS:

OVERALL:
A very interesting, well-written and well-executed study!

METHODS
* 89: Please explain why for total tests, period goes from May 27th, 2020, to June 27th, 2021. And why not for positive tests?

* 90-92: "Notifications included the date, test result (positive, negative), the reported gender/sex of the individual (categorized as woman, man, or other), which could align with administrative sex, attributed sex, or self-reported gender identity, date of birth or age, and residential address."
The list makes it the subsentence about gender/sex unclear. Because of the importance of this information, I suggest to just make a separate sentence.
* 106-107: "The Swiss-SEP is an area-based socio-economic position index centered on residential buildings, encompassing overlapping boundaries." What do you mean exactly with overlapping boundaries? What happens when a persons resides in multiple overlapping SEP-neighbourhoods? How to decide which value for SEP?
* 109: "It is based on indicators such as median rent per square meter (income)" I don't see this as a proxy for income; but rather as for the material aspects of socioeconomic circumstances. Also note that home owners are not reflected in this measure.
* 110: Occupation type of the household head?
* 110: "crowding" Can you provide more context on how crowding measures a dimension of SEP? I see the epidemiological value of incorporating it, but for me this measures more the demographic context and not the SEP.
* 112-118: I suggest to structure this text by outcome, to underline the differences. Also, please provide argumentation on why hospitalization and ICU admission notifications were not assigned a (average) SEP.
* Provide more information on the separate waves of the epidemic, and how these were assigned. Just out of curiosity: no interwave periods were assigned? (To back up information presented in the results section e.g., fig 1)
*Why use the population of December 2020 and not before the outbreak? Wouldn't it be possible that the population structure was already influenced by the outbreak by then?

RESULTS
*Overall: Something strange happened with the notation of the numbers above 1,000: the comma is placed as an apostrophe: 815'300
* [Fig. 2 – Cumulative incidence across SEP and age groups] Clear visual; but I would put NA in the ICU admissions and hospitalisation boxes (or find an alternative way to show that you intentionally leave these blank). Also, the titles on the x-axis for SEP need a bit of tweaking: perhaps put them diagonally like the Age groups? Suggestion to add confidence intervals.
* 196-200: Interesting, but I am more interested to know whether simultaneously adjusting for SEP and Age (together with gender/sex) changed the pattern.
* 228-230: I would phrase this more nuanced. The pattern is not significant; Also, this raises more questions than it solves.. Why only the elderly age groups? Why Poisson? Why not look for effects of triple interaction terms for the other outcomes?
* Supplementary table 6: are these IRRs adjusted for gender/sex, age, and SEP simultaneously?

DISCUSSION
*260-261: "These social determinants of health were found to contribute to the observed disparities (3, 39, 40)" In the Swiss context? For which outcomes?
*Strenghts/Limitations section: I suggest to add more context on the Vaud Canton and its representativeness for Switzerland, as well as provide insights into how your findings may change throughout the course of the epidemic (differences between waves).

PLEASE COMMENT

Q 4 Is the title appropriate, concise, attractive?

The title is appropriate, but I believe there may be some more potential in terms of attractiveness;

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?

Yes.

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:

Minor revisions.