Reviewer #2

The study is important and well performed, but needs some improvements before acceptable.

We appreciate Referee #2 for the time invested, great effort, and critical reading of the manuscript. We acknowledge the reviewer's comments and apologize for the mistakes. We reiterate our gratitude for Referee #2´s contributions, they positively improve and strengthen the manuscript.

First, it is crucial that the authors make a statement which variants were identified. It is obviuos these days that Omicron has a higher infection rate than any other strain before, thus it is likely that even the lowest aerosolic concentrarion may lead to an infection in vivo.

We appreciate the suggestion. We have only been able to recover and partially sequence the nucleotides of swabs from patients where we studied aerosols. The swabs of the patients who volunteered to perform only a cough sample could not be recovered and the hospital where they were admitted has no information in this regard. All the cases that we have been able to sequence (8) were Omicron BA.1. According to his comment, we will include this information in section 2.7 (Lines 282-286), 3.2. (Lines 376-377) and the partial sequences in the Supplementary Material (Table S1).

Second, it is important to take into account that coughing produces many large droplets and less small aerosolic virus particles, but the latter are assumed to be more relevant for viral spreading as they are also able to leave leaky masks (either not correctly worn or of bad quality).

Thank you for your wise comment. We have included references such as Johnson et al. (2011) (now as reference [11]) where we refer to the disparity in the size of droplets and aerosols depending on the respiratory event. We agree that in conditions of interpersonal distance and closed spaces, aerosols are more relevant. However, in the absence of masks and without interpersonal distance, large droplets may play a predominant role in transmission, based on knowledge to date.

Moreover, this reviewer fully agrees that the ct-value does not say anything on infectiousness. infectiousness strongly depends on host factors that are responsible for the susceptibility. In cell cultures it is likely that the novel generations of cell cultures used for the detection of SARS-CoV-2 are much more sensitive than early attempts in 2020 when the pandemics started.

We value and appreciate your comment. However, we are aware that in clinical practice the Ct value is used to measure the infectiousness of the individual and we have considered it relevant to include a small section clarifying this concept. For example, in the hospital where we work, they take Ct in COVID-19 patients as the only criterion to be eligible for surgery.

Additionally, an Austrian study has clearly shown that ct values variy among different labs and different techniques, and even the same PCR chemistry performs different if the thermocycler is different. This is not sufficiantly discussed, but is also not part of the study.

Agree. To clarify this we have increased the discussion of this part. Please review lines 329-333.

Finally, for me as a virologist it would be extremely helpful if the authors could provide a more detailed scheme/figure showing how the experimental setup was performed. I have already

participated several workshops with aerosol researchers and learned much from these colleagues, but the waste majority of virologists (and other disciplines) has not.

We appreciate this suggestion. We have added a explanation concerning the experimental setup in lines 230-243 and Figure 3. We hope they are clear enough. We can incorporate more information if required by the the reviewer wishes.

It would strengthen the role of aerosolic research, which in my view is crucial for future research and was underestimated in the current pandemics.

We have emphasized this aspect in the conclusions, please see lines 555-561.

Once again, we sincerely appreciate the Referee #2´s comments and suggestions. Referee #2 made a deep revision and his/her comments strengthen the review and increase its quality largely. The referee pointed to many important aspects of the manuscript and identified several mistakes. We apologize for all of them. We reiterate to referee #2 our gratitude for reviewing this manuscript.