

# A look into Covid-19 spreading through the lodging sector



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A critical issue in the hospitality industry has to do with customer satisfaction. Customer satisfaction is defined as the gap between customer expectations and the actual experience (Hwang & Seo, 2016). Scholars commonly approach customer expectations by mining the experience of users imprinted in online reviews. Currently, they are questioning whether the Covid-19 crisis has affected the behaviour of customers in the lodging industry. Research on this topic is underway, however, none of the studies found examine the experience of customers of Peer-to-peer accommodations and at the spatial level. This research integrates text mining approaches with spatial analysis techniques to explore the experience of Airbnb users after the outbreak of covid.

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Covid-19, Sentiment Analysis, Topic  
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## REFERENCES

Hwang, J., & Seo, S. (2016). A critical review of research on customer experience management: Theoretical, methodological and cultural perspectives. *International Journal of Contemporary Hospitality Management*, 28(10), 2218–2246. <https://doi.org/10.1108/IJCHM-04-2015-0192>

## METHODOLOGY

The experience of users was examined based on the content of reviews and the location of properties collected from the platform *Inside Airbnb* and stored in a PostgreSQL spatial database. Reviews were pre-processed with *Python* to remove those in non-English language and to identify nouns.

The analysis was conducted in two parts. In the first part the experience of users before and after the outbreak of covid was compared. Thus, only properties with reviews one year after the outbreak, which, at the same time, had reviews one year before it were considered in the analysis. Reviews were characterized based on **sentiment analysis** and **topic modelling**. Sentiment analysis was implemented with the model VADER, which classifies reviews based on a compound score into positive, neutral, and negative. Likewise, properties were also classified, but based on the average compound scored computed from all the reviews from each time period (pre - and post - covid). Afterwards, they were visualized with **Kernel Density** (see Fig.1).

On the other hand, the most relevant topics from the previously classified reviews were identified by using text mining techniques such as, **Relative Term Frequency (RTF)** and **Term Frequency-Inverse Document Frequency (TF-IDF)**, then these topics were visualized with **Network Diagrams**.

In the second part only those reviews that contained covid-related terms were analysed. These terms were collected from scientific articles excluding open compound words and ambiguous words. As in the first part, reviews were characterized using sentiment analysis and topic modelling.

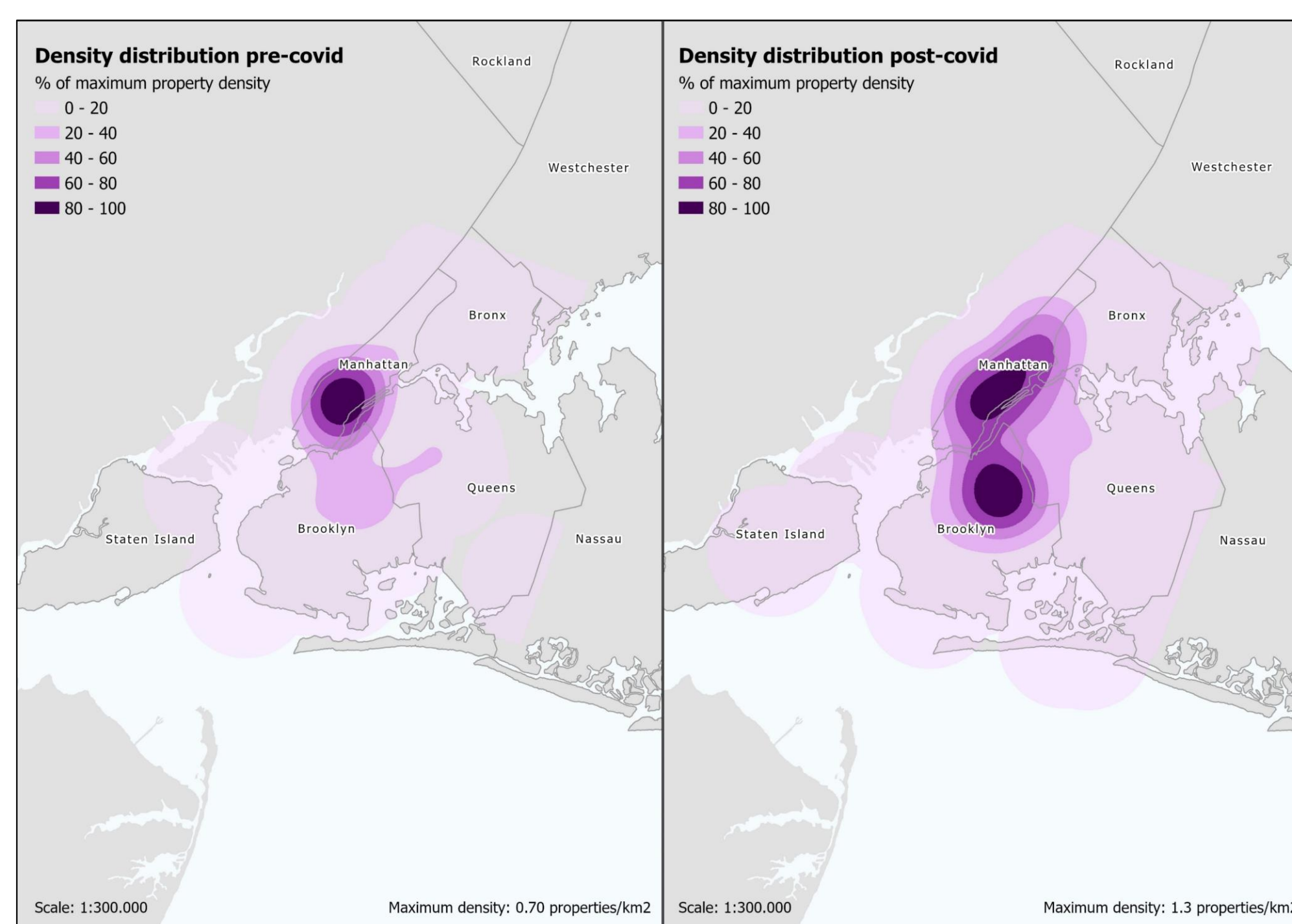


Fig. 1. Density distribution of properties with average negative polarity in New York before and after the outbreak of covid.

## RESULTS AND CONCLUSIONS

As case study, only two cities were analysed, i.e. Rio de Janeiro (Brazil) and New York (U.S). The results from sentiment analysis did not show a significant change in the proportion positive, neutral and negative reviews before and after the outbreak of covid in both cities. Positive reviews decreased no more than 2% and negative increased no more than 1%.

Nevertheless, at the spatial level, it was possible to visualize changes in the concentration of properties according to the average compound score (see Fig. 1). Future research could delve into the role of properties' location in the user experience during health crises.

Although the results from sentiment analysis did not reveal a significant change in the experience of Airbnb users, topics from covid-reviews (see Fig. 2) suggested that users experienced situations related with the pandemic (e.g., use of mask and hand sanitizer, etc).

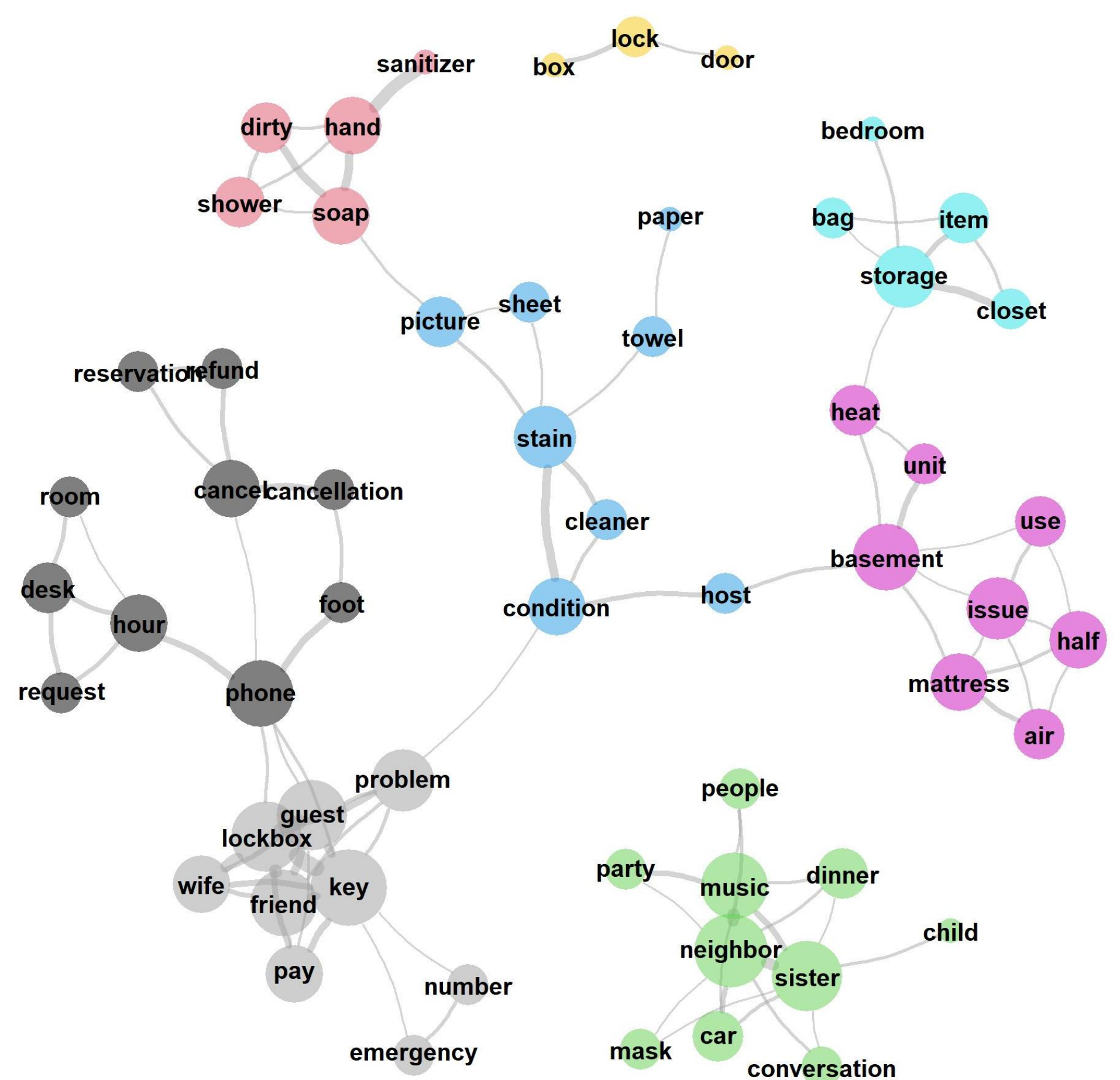


Fig. 2. Network diagram with the most relevant topics found in positive reviews that contained covid-related terms from properties in New York.