

# Review of: "Assessment of COVID-19 from Features Extraction of Exhaled Breath Using Signal Processing Methods"

Shokhan M. Al-Barzinji<sup>1</sup>

<sup>1</sup> University of Anbar

Potential competing interests: No potential competing interests to declare.

## Dear Editor

The research paper titled "**Assessment of COVID-19 from Features Extraction of Exhaled Breath Using Signal Processing Methods**" provides a comprehensive analysis of using exhaled breath waveforms to identify COVID-19 infection. The study develops an algorithm for segmenting and computing features from exhaled breath patterns, aiming to distinguish between COVID-19 and non-COVID conditions.

The paper presents a promising alternative for COVID-19 detection through the analysis of exhaled breath. The method's non-invasive nature and the potential for rapid screening make it a valuable tool in clinical settings. However, further research with larger, more diverse populations and comparative studies against existing diagnostic methods is necessary to fully establish its efficacy and reliability.

## Strengths of this paper:

1. **Clinical Relevance:** The study's focus on a practical, quick, and reliable method for early detection at the point of patient admission has strong clinical implications, especially in reducing the workload on healthcare systems.
2. **Detailed Methodology:** The study meticulously outlines the process, including data collection, signal preprocessing, feature extraction, and statistical analysis. This transparency allows for reproducibility and validation of results.
3. **Innovative Approach:** The paper explores a novel, non-invasive method for COVID-19 detection using breath analysis, which is a significant advantage over traditional methods like RT-PCR.
4. **Statistical Rigor:** The statistical significance of various features in distinguishing COVID-19 is well-established, with clear metrics such as p-values and ROC curves presented.

## Weaknesses of this paper:

1. **Feature Selection:** While several features were identified as significant, the paper could benefit from a more detailed discussion on why specific features (e.g., slope, area, intersection angle) were chosen and their physiological relevance.
2. **Limited Sample Size:** The study's sample size of 40 COVID-19 patients and 20 non-COVID participants is relatively

small. Larger studies are necessary to validate the findings and ensure broader applicability.

3. **Exclusion Criteria:** The exclusion of patients with other respiratory conditions like asthma or COPD might limit the generalizability of the results, as these conditions are prevalent and can affect breath analysis outcomes.