



# Suggestions to the article: demonstrating the ascendancy of COVID-19 research using acronyms

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Received: 30 August 2021 / Accepted: 8 February 2022 / Published online: 12 March 2022  
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## Abstract

The article published on 16 May 2021 is interesting and impressive, particularly on the Figure displaying several acronyms in trend. Although the most popular eight acronyms in 2019 and 2020 are individually highlighted and labeled, how to determine the points in 2019 and 2020 is required for classifications. The analysis for the evolution of keywords is common and necessary in the bibliographic study. None of the studies addressed the determination of the bursting point for a given keyword over the years. We aim to illustrate the way to determine the inflection point on a given ogive curve and apply the temporal bar graph (TBG) to interpret the trend of a specific keyword (or acronym). The prediction model is based on item response theory, commonly used in educational and psychometric fields. The eight acronyms presented in the previous study were demonstrated using the TBG. We found that the TBG includes more valuable information than the traditional trend charts. The inflection point denoted the topic burst indicates the turning point suddenly from increasing to decreasing. The TBG combined with the inflection point to represent the trend of a given keyword can make the data in trend easier and clearer to understand than any graph used in ever before bibliometric analyses.

**Keywords** Acronym · Bibliometric analysis · Temporal bar graph · Item response theory · Prediction model

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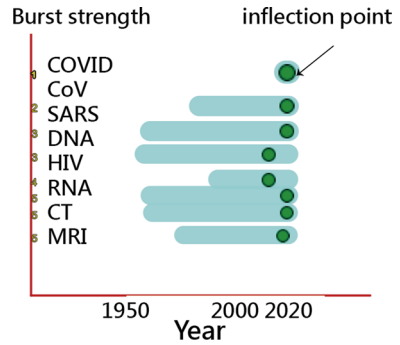
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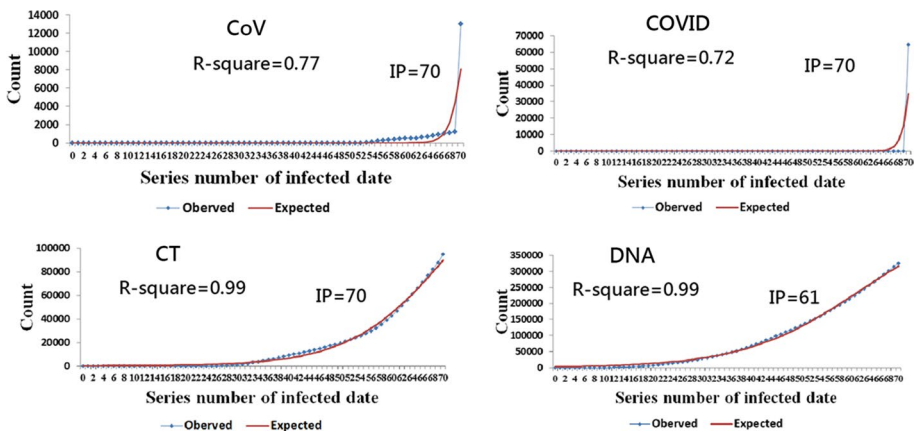
**Fig. 1** The determination of inflection point on a given curve



With great honor and interest to read the study by Barnett and Doubleday on demonstrating the ascendancy of COVID-19 research using acronyms (Barnett & Doubleday, 2021). However, one major concern was the determination of burst points for keywords in the study. For example, the eight most popular acronyms in 2019 and 2020 were individually labeled with a graph, but no further information about the method used to determine the bursting point was interpreted.

Similar to the inflection point of accumulative confirmed cases in COVID-19 determined for each country/region (Lee, 2021; Wang 2021), the prediction model based on item response theory (IRT) was built in Microsoft Excel. The inflection point was then determined by searching the maximal changing point on a given ogive point (e.g., using the absolute advantage coefficient (AAC) at the burst point) (Kuo, 2021; Yang 2021). The inflection point denoted by the topic burst (Shen, 2018) was demonstrated in the four acronyms in Fig. 1. The observed data using the Solver add-in tool in MS Excel (Lee, 2021; Wang 2021). The inflection point appears on the smooth plane curve where curvature changes sign from an increasing concave (concave downward) to a decreasing convex (concave upward) shape, or vice versa (Wiki, 2021).

The burst strength is defined by the equation ( $=\log(\text{square}(\text{AAC} \times \text{count at inflection point}))$ ). The trends of those eight acronyms are jointly displayed on a temporal bar graph (TBG) (Shen, 2018). More information is immediately popped up, including the raw data,



**Fig. 2** The temporal bar graph to display the trend of keywords

burst strength, and frequency at the inflection point) once the icon of the inflection point is clicked. In Fig. 2, we can see that all inflection points are determined, which are coincided with the eight most popular acronyms in 2019 and 2020 addressed in the study (Barnett & Doubleday, 2021).

The TBG combined with the inflection points of keywords can make the data in trend easier and clearer to understand than the traditional trend chart used in ever before bibliometric analyses.

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