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Establishment and Application of the Technology Patterns for Measurement by Stages, Inflection Point Determination on the Epidemic Waves of the COVID-19 Pandemic

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic has seriously affected the people's life and health, socioeconomic development and even national security and openness worldwide. The staging measurement, inflection point judgment, prevention and control on the epidemic waves of COVID-19 pandemic have become the important scientific and technological issues for global surveillance, early warning, control and evaluation, have also become the regularity and stage problems of its aetiology, as well as the strategic and fundamental issues of its prevention and control. There were hardly any technology patterns on the staging measurement and inflection point determination of the epidemic waves. We summarized the trends of the 4 major epidemic waves owing to emerging severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants, viral transmission routes, and variants selection in the world and the United States. Established the technical patterns of the COVID-19 epidemic waves process, monitoring and early warning, prevention and control, as well as measurements in epidemiology and aetiology. The segmentation on the histogram of the number of new cases per week includes the initial period, rising stage, platform stage and decline stage of cases growth. The segmentation on the curve graph of the accumulated number of cases per week includes the initial period, early stage of inflection point, late inflection point, and stable stage of cases growth. Also get the following early detection, effective monitoring, effective early warning, effective response, critical prevention and critical control period. The technology patterns were used to analyze the 2 outbreaks in the whole crowd of India and the medical and health personnel of America, as well as 1 gathering epidemics in Ruili city of China. Determined the two-way predictive function both on the severity and improvement of the epidemic with inflection point and on the development and effectiveness of the epidemic without inflection point. On the basis of the characteristics of the 4 major epidemic waves, baseline fluctuations and its dominant niche variants (Alpha, Beta, Gamma, Delta and Omicron), To support future decision making, it is paramount to get a better insight into the involved technology patterns. Doing so is not only relevant for the COVID-19 pandemic, but also crucial for expanding our similar to the COVID-19 and SARS-CoV-2 pandemic preparedness toolbox.

Keywords

COVID-19 Pandemic, Epidemic Wave, Measurement by Stages, Technology Patterns