

## Using an Epidemiological Model to Study the Spread of Misinformation during the Black Lives Matter Movement

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**Abstract :** The proliferation of social media platforms like Twitter has heightened the consequences of the spread of misinformation. To understand and model the spread of misinformation, in this paper, we leveraged the SEIZ (Susceptible, Exposed, Infected, Skeptics) epidemiological model to describe the underlying process that delineates the spread of misinformation on Twitter. Compared to the other epidemiological models, this model produces broader results because it includes the additional Skeptics (Z) compartment, wherein a user may be Exposed to an item of misinformation but not engage in any reaction to it, and the additional Exposed (E) compartment, wherein the user may need some time before deciding to spread a misinformation item. We analyzed misinformation regarding the unrest in Washington, D.C. in the month of March 2020, which was propagated by the use of the #DCblackout hashtag by different users across the U.S. on Twitter. Our analysis shows that misinformation can be modeled using the concept of epidemiology. To the best of our knowledge, this research is the first to attempt to apply the SEIZ epidemiological model to the spread of a specific item of misinformation, which is a category distinct from that of rumor and hoax on online social media platforms. Applying a mathematical model can help to understand the trends and dynamics of the spread of misinformation on Twitter and ultimately help to develop techniques to quickly identify and control it.

**Keywords :** Black Lives Matter, epidemiological model, mathematical modeling, misinformation, SEIZ model, Twitter

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