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DEATH OF PATIENTS WITH COVID-19 AND THE ROLE OF MATHEMATICAL MODELS IN DECIPHERING ITS CAUSE

Yuri Kogan, Zvia Agur

Institute for Medical BioMathematics, Israel

ABSTRACT

The known causes of death in people with COVID-19 include acute respiratory distress syndrome (ARDS), multiple organ failure (MOF), pulmonary embolism, superinfection, and myocardial infarction. We hypothesize that all these conditions originate from a single cause – disrupted metabolism. We discuss various available methods for modeling metabolism and propose a comprehensive model that can be used to validate our hypothesis and help reduce COVID-19 mortality. The strength of this model lies in its ability to represent both healthy and disrupted tissue metabolism, along with pathological outcomes, within a simple system of nonlinear equations. Phase plane analysis shows different system behaviors in healthy, cancerous, and COVID-19 cases.