

# Epidemiological Analysis of MERS-CoV Using NN and SVM in Respect to Applicability of AI in Multiple Classes

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**Abstract**— Middle East Respiratory Syndrome is a respiratory disease spread by MERS coronavirus, which had its first occurrence in Kingdom of Saudi Arabia. In this paper, we analyzed the transmission route of MERS-CoV with a novel molecular approach. We collected the amino acid sequence of MERS-CoV from 15 different regions, which were then analyzed with Neural Network and Support Vector Machine. With the usage of artificial intelligence algorithms, while there was a failure on extracting a rule which can distinguish each virus and figuring out the transmission route, the common features of the sequences were detected. As a result, we could justify the previously studied result on the transmission route. During the procedure, we investigated the basic cause of the failure in consideration of the principle of the algorithms used, and suggested a better path of analysis using artificial intelligence applied to epidemiological studies.

**Keywords**—Middle East Respiratory Syndrome, MERS, Neural Network, Support Vector Machine, transmission route, epidemiological investigation



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