

4. A neural net forecasting of the viral subtype dynamics: the enterovirus and the influenza virus.

(ニューラルネットモデルを用いたエンテロウイルス抗原型流行予測の試み)

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In summer when it is high humidity in Japan, the density of the infected by the enterovirus become the highest. In enterovirus group, there are some subtypes. In every year, some antigen types are reported but the major one differs almost every year. The aim of our present study is to predict the density of the infected in the next year and also predict the major types of the enteroviruses. The networks we used as the predictors for the density are FIR multi layer perceptron which are used as the predictors for temporal processing in the other ways. To predict the subtype changing in the enterovirus, first we predict the density of infected every year not considering the antigen types with the networks which has one input neuron and one output neuron. Second, we modified the networks for the multiple-type predictor. After the training, the networks can successfully forecast the hypothetical time series including chaotic trajectory. However, the predictive power of the networks trained with noisy data can be significantly low, because the network learned too much from the noisy component. Taking into account these potential problems, we have improved the predictor to forecast the subtype changes in enterovirus morbidity.