1163-60-923 **Milan Stehlik*** (mlnstehlik@gmail.com), Department of Applied Statistics, Johannes Kepler University Linz, Altenberger Straße 69, Linz, – A4040. *Modelling and prediction of COVID-19 outbreaks.*

We formulate the ill-posedness of inverse problems of estimation and prediction for COVID-19 outbreaks from statistical and mathematical perspectives. These leave us with a plenty of possible statistical regularizations, thus generating plethora of sub-problems. We can mention the as examples stability and sensitivity of peak estimation, starting point of exponential growth curve, or estimation of parameters of SIR model. In a specific country, one can define several social groups which can contribute in a heterogeneous way to whole country epidemiological curves. Moreover, each parameter has its own specific sensitivity, and naturally, the more sensitive parameter deserves a special attention. E.g. in SIR (Susceptible-Infected-Removed) model, parameter β is more sensitive than parameter γ. In simple exponential epidemic growth model, b parameter is more sensitive than a parameter. We provide sensitivity and illustrate it on the country specific data. We also discuss on statistical quality of COVID-19 incidence prediction, where we justify an exponential curve considering the microbial growth in ideal conditions for epidemic. We model number of infected in Iowa State, USA, Hubei Province in China, New York State, USA. (Received September 14, 2020)