Mathematical modelling and in silico experimentation to estimate the quantity of COVID-19 infected individuals in Tijuana, México

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This work is devoted to construct a mathematical model of Öve Örst-order ordinary di§erential equations that may allow us to estimate the number of people infected by SARS-Cov-2 in Tijuana, Baja California, MÈxico. Our model is formulated by considering the widely known SIR compartmental model and the infection and mortality rates provided by Mexicoís Secretary of Health where they divide the infected Mexican population into four compartments: asymptomatic, moderate, severe, and critical. We incorporate this information as parameters and new equations to the basic SIR system and formulate our model in order to describe the evolution of susceptible, infected, accumulated, recovered and deceased people due to COVID-19 in Tijuana. Nonetheless, massive testing is still not available in the country. Hence, to estimate the virus transmission rate and the doubling time we based our in silico experimentations on the number of registered deaths presented by Baja Californiaís Secretary of Health. Numerical simulations illustrate higher numbers of both active and accumulated infected people in the city. The latter implies that massive testing should be implemented to accurately determine the spread of the disease.

Keywords: *COVID-19; Tijuana, Mathematical modelling; In silico experimentations; Parameter* estimation.