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Susana Pinheiro* (spinheiro@qcc.cuny.edu) and **Diogo Pinheiro** (dpinheiro@brooklyn.cuny.edu). *On a model for two competing pathogen strains with infection history*. Preliminary report.

We will introduce and discuss a compartmental model describing the competition between two strains of the same pathogen such as is the case, for instance, of two co-circulating variants of the coronavirus. Our preliminary results include the following: a) If one of the pathogens strains basic reproduction number is sufficiently higher than that of the other strain, only the strain with the higher basic reproduction number becomes endemic, the other strain becomes extinct in the long run, regardless of having a basic reproduction number greater than one. That is, we provide conditions on the basic reproduction numbers of the two pathogen strains guaranteeing that they eventually do not co-circulate within a susceptible population. b) If both strains' basic reproduction numbers are greater than one and sufficiently close to one another, the two variants become endemic in the long run. This sort of closeness condition on the basic reproduction numbers prevents one of the strains from out-competing the other and driving it to extinction. Finally, we will summarize our results in terms of a bifurcation diagram, attempting to provide a clear qualitative picture for all the possible alternative asymptotic outcomes. (Received January 26, 2022)