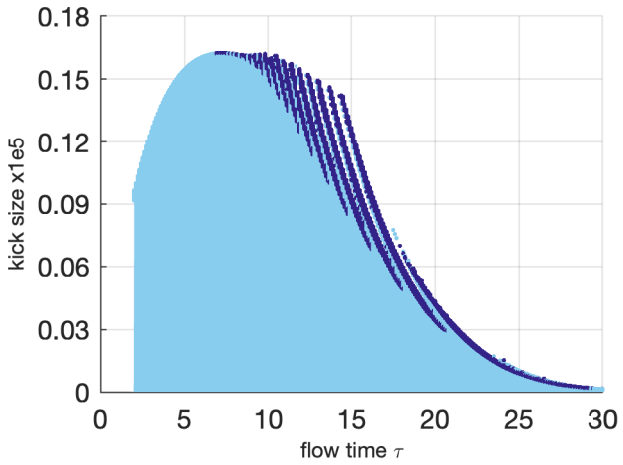

Figure 1: Regions in parameter space that correspond to long term immunity after an initial infection (light blue), a transient period of reinfection before long term immunity (dark blue).

In a previous paper[1] and shown in Figure 1, we gave a case study in which we determined a region of parameter space that corresponds to long term protection (light blue). The model uses an impulsive dynamical system with parameters of flow time (exposure frequency) and kick size (viral dose size). In further examination of the model, we found a second region of parameter space that yields a transient period of multiple reoccurring infections before long term immunity from illness (dark blue). We believe this model could be re-parameterized for Rotavirus, potentially giving a theoretical explanation for patterns of Rotavirus infection in children and adults.

[1] A. Hoyer-Leitzel, S. Iams, A. Haslam-Hyde, M. L. Zeeman, and N. Fefferman, "An immuno- epidemiological model for transient immune protection: A case study for viral respiratory infections," *Infectious Disease Modelling*, vol. 8, no. 3, pp. 855–864, 2023.