

Epidemiological Parameters Estimation with Realistic History-Dependent Disease Spread Dynamics

Hong, Hyukpyo

1) *Department of Department of Mathematics, University of Wisconsin–Madison*

hyukpyo.hong13@gmail.com

ABSTRACT

Epidemiological parameters such as the reproduction number, latent period, and infectious period provide crucial information about the spread of infectious diseases and directly inform intervention strategies. These parameters have generally been estimated by ODE models that involve an unrealistic assumption of history-independent dynamics for simplicity. This assumes that the chance of becoming infectious during the latent period or recovered during the infectious period remains constant, whereas in reality, these chances vary over time. In this talk, we illustrate that conventional approaches with this assumption cause serious bias in epidemiological parameter estimation. Also, we present our new method that adopts realistic history-dependent disease dynamics and thus addresses this bias. Our method more accurately and precisely estimates the reproduction number than the conventional approaches solely from confirmed cases data, which are easy to obtain through testing.