1116-92-589 **Suzanne M. O'Regan*** (soregan@nimbios.org) and **John M. Drake**. *Leading indicators of bifurcations in epidemiological systems.*

Epidemiological systems may exhibit bifurcations such as infectious disease emergence and elimination. These bifurcations may be anticipated because prior to reaching the dynamical threshold, the system gradually loses stability ('critical slowing down'). Non-parametric approaches that are independent of model-fitting would advance infectious disease forecasting significantly. We consider compartmental epidemiological SIS and SIR models that are slowly forced through a critical transition. We develop expressions for the behavior of several candidate indicators during the approach to emergence or elimination. We show that moving-window estimates of the candidate indicators may be used for anticipating critical transitions in infectious disease systems. Although leading indicators of elimination were highly predictive, the approach to emergence was much more difficult to detect. It is hoped that these results, which show the anticipation of critical transitions in infectious disease systems to be theoretically possible, may be used to guide the construction of online algorithms for processing surveillance data. (Received September 20, 2015)