1125-92-1415 **Linda J. S. Allen*** (linda.j.allen@ttu.edu) and **William Tritch**. *Duration of an Epidemic Near the Critical Threshold of* $\mathcal{R}_0 = 1$. Preliminary report.

If the value of the basic reproduction number $\mathcal{R}_0 > 1$, an increase in number of cases is expected while if $\mathcal{R}_0 < 1$, a decrease in number of cases is expected. When the critical threshold of $\mathcal{R}_0 = 1$ is exceeded an outbreak occurs. The magnitude of $\mathcal{R}_0$ is also an indication of the seriousness of the disease and of the duration of an outbreak. In continuous-time Markov chain epidemic models, we investigate the probability and the duration of an outbreak as a function of $\mathcal{R}_0$ via branching process theory. Analytical formulas are obtained for the mean duration and higher-order moments from the branching process approximation, conditioned on disease extinction. The mean duration in the branching process approximation approaches infinity as $\mathcal{R}_0$ approaches one. Although this approximation breaks down for models with finite population sizes, it is shown for sufficiently large population sizes that the mean duration generally increases near the critical threshold. The results are illustrated and discussed for vector-host models and their implications for disease control. (Received September 16, 2016)