**Differential effects of case management and test-and-treat on infectiousness**

#### Additional Material to:

#### Resurgence of malaria infection after mass treatment: a simulation study

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Define *κ* as the infectiousness of the human population over some arbitrary time-interval, (possibly measured by the proportion of mosquitoes that become infected at each feed). This can be analysed as two components:

where the first component, , is the contribution of new infections arising during the interval (proportional to , the force of infection) and is the contribution of the standing crop of pre-existing infections (proportional to , the prevalence). and thus represent the different average infectiousness of the different categories of infection while and are constant scale-factors.

Clinical malaria disproportionately occurs during the initial period of an infection. Treatment of some proportion, , of clinical malaria cases thus reduces the first component, and hence the overall infectiousness to:

and the proportion by which the overall infectiousness is reduced is:

which is a decreasing function of *p.*

Conversely, test-and-treat applied to some proportion, , of the infected population reduces the second component, and hence the overall infectiousness to:

and the proportion by which the overall infectiousness is reduced to:

which is an increasing function of *p.*

This analysis assumes that the proportions, and are independent of prevalence.