**S1 METHODS: EFFECTIVE CASCADE EQUATION DESCRIPTION**

 EQ. (1)

Where;



A = proportion of malaria fevers seeking care;

Pp = proportion of care-seeking malaria fever episodes accessing provider p;

Dpd = proportion of malaria fever episodes treated by provider p with antimalarial therapy d;

Hpd = proportion of fever cases treated with drug d by provider p that adhere with the regimen;

Tpd = cure rate of antimalarial therapy d obtained from provider p;

Cure rate indicator is modelled to account for prescribed antimalarial quality, prevalence of drug resistance to the prescribed treatment, and the clinical therapeutic efficacy of the prescribed treatment as denoted in EQ. 2 below.

 EQ. (2)

Where;

Qpd, Rd and Cd = ≥ 0 and ≤ 1

Qpd = Proportion prevalence of counterfeit or of substandard quality antimalarial treatments d obtained from provider p

Rd = Proportion of drug resistance malaria episodes attributable to drug d;

Cd = Therapeutic efficacy rate for drug d