The Dynamics of Vector-Borne disease

Two important definitions:

(1) **Vector competence:** the ability of a vector to transmit a pathogen

For example,
Can the pathogen grow inside the vector?
Can the vector be transmitted by the vector?

(2) **Vectorial capacity:** rate at which future inoculations arise from a currently infective case

Vectorial capacity = C

C= The average number of new infections arising daily from a single infection

$$C = \frac{ma^2VP^n}{-\log_e P}$$

m = number of vectors per human
a = number of human blood meals per mosquito per day
V = vector competence
P = daily survival rate
n = incubation period in vector (extrinsic incubation period)

4 Host Searching

Host searching consists of three phases:

1. Appetitive searching
2. Activation and orientation
3. Attraction