

# The Dynamics of Vector-Borne disease

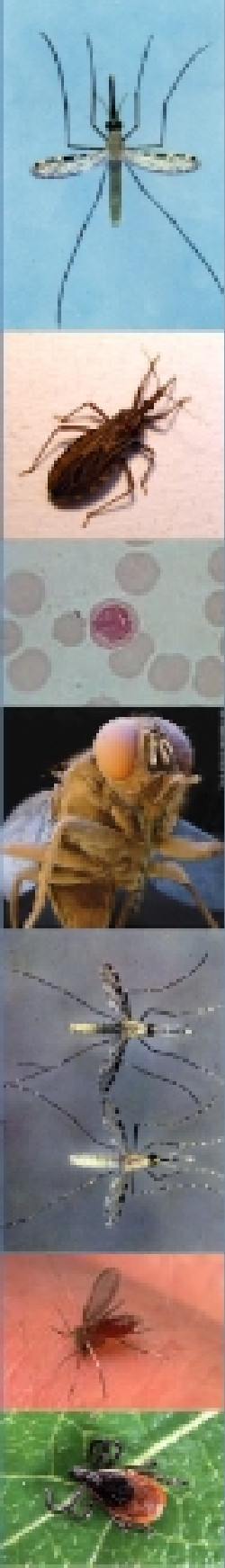
## Two important definitions:

(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

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

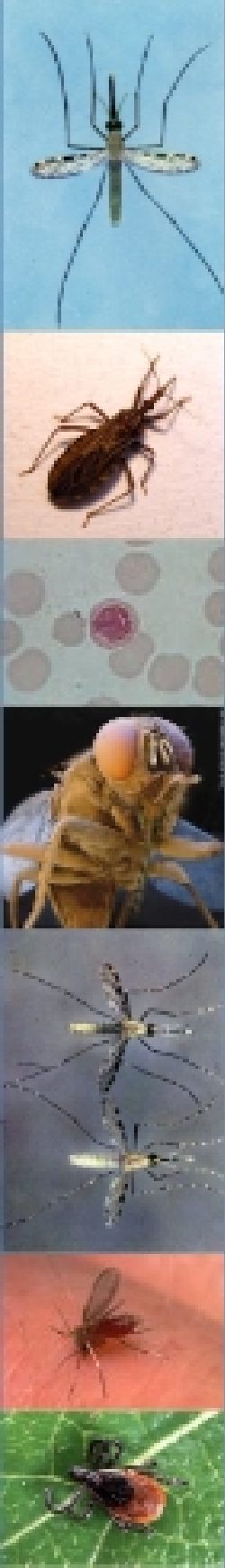
**m** = number of vectors per human

**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

