in their salivary glands which are actually infective. The probability of a mosquito surviving one day is called “p”. The proportion of mosquitoes surviving for “n” days is p^n and their subsequent expectation of life is $1/-\log_e p$. The expectation of life after surviving through n days is $p^n/-\log_e p$. During this time, they will bite “a” time each day (with “a” is defined as “the average number of men bitten by one mosquito in one day”), and b the proportion of these bites will be infective (meaning potentially inducing malaria infection, *i.e.* without considering human immunity). Thus, the reproduction rate of the parasite by anopheles’ vectors is estimated by the famous formula:

$z= ma^2bp^n/r(-\log_e p)$

The reproduction rate corresponds to the total number of new (“secondary”) infections which could be distributed by anopheline population from a single human “primary” infection, in the absence of immunity. The aims of reducing transmission are to decrease this “z” below 1, with entomological action against density of bite (ma), longevity (p), anthropophily (a).

But, considering the issue of evaluation of parameters “r” (called “recovery rate”) and “b” (for actual infectivity of sporozoites) it was developed the concept of vectorial capacity (Garrett-Jones, 1964a) with the simplified formula: $CV= ma^2p^n/-\log_e p$

The vectorial capacity is defined as “the average number of inoculations with a specified parasite, originating from one case of malaria in unit time, that a vector population would distribute to man if all the vector females biting the case became infected” (Garrett-Jones and Grab, 1964). The vectorial capacity is thus a density-and longevity dependent attribute of the mosquito and was used for “The Assessment of Insecticidal Impact on the Malaria Mosquito's Vectorial Capacity, from Data on the Proportion of Parous Females” (Garrett-Jones and Grab, *loc.cit.).* Vectorial capacity is an interesting indicator in epidemiological entomology, for example as “prognosis for interruption of malaria parasite transmission (Garrett-Jones, 1964b) or to evaluate the house spraying with DDT (Garrett-Jones and Shidrawi, 1969) where it was compared to reproduction rate.

Reproduction rate is the total new infections which could occurred from one human infection (with infective gametocytes) while the vectorial capacity is new infections in a unit of time (Smith *et al.*, 2007).

The vectorial capacity is easy to evaluate with the biting rate (ma) and the parous rate (Detinova, 1962) which allows an estimation of the longevity of vectors and the “assessment of insecticidal impact” (Molineaux *et al.,* 1979).

The main parameters used in entomological evaluation of malaria parasite transmission are the inoculation rate and the vectorial capacity.

But, in both formulae, one parameter is not taken into consideration; “t” (in days) of length of stay in malarious area, to evaluate the evolution of the risk of being bitten by infective vector according to the times spent on this place. Dealing with this issue Martin Birley developed a new formula of the risk “h_r” of receiving an infective bite according to the density of bite (ma), infectivity of vector (s) and the time, duration of exposure, “t”: and the formula is now $h_r= 1-(1-s)^{ma.t}$

The formula was already used to describe other entomological situation (Gazin *et al.,* 1985) and it is used in Angola to evaluate, and compare, four methods of vector control implemented in Balombo program considering the length of stay of human being in house before, and after, implementation of vector control.

2 Materials and Method

In 2007 a long-term (11 years) comprehensive malaria vector control program was implemented in eight villages around the town of Balombo, (Benguela Province, Angola). The goal was to compare, in natural situation, the efficacy of four methods of vector control: classical long-lasting deltamethrin insecticide treated nets (“LLINs”) PermaNet 2.0®, installed in two villages; LLINs in combination with insecticide (deltamethrin) treated plastic sheeting (“ITPS”) model ZeroFly® in two villages; deltamethrin treated ITPS model ZeroVector® in two villages,