Medical Xpress

Potential for malaria transmission higher than previously thought

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Each year, malaria results in more than a million deaths. Controlling this disease involves understanding its transmission, and understanding its transmission means understanding its basic reproductive number, R0. For all infectious disease, R0 describes the most important aspects of transmission as it is the expected number of hosts that can trace their infection directly back to a single host after one disease generation. For vector-borne diseases, such as malaria, R0 is given by a classic formula.

In a new study published in *PLoS Biology*, David Smith and colleagues demonstrate that estimates of R0 range from around one to over 3,000, providing much higher estimates than previously thought, with serious implications for the control of the disease.

The author provides 121 estimates of R0 for Plasmodium falciparum malaria in African populations. In addition to the higher estimates of R0, they also show that in small human populations, R0 approximates transmission when counting infections from mosquito to mosquito, but overestimates it from human to human. Previous studies showed that transmission is amplified if some humans are bitten more than others. The authors confirm that such heterogeneous biting amplifies transmission counting from mosquito to mosquito, but it can also dampen transmission counting from human to human. Humans who are bitten most both infect a large number of mosquitoes and absorb many infectious bites.

What does this mean for control? When R0 is in the thousands,

eliminating malaria may seem impossible. If transmission from the humans who are bitten the most can be targeted, however, local elimination can still be within reach.

Source: Public Library of Science