



Understanding Malaria

Strategies for Managing Malaria

Suggested Responses

Comprehension Questions

1. False

2. False

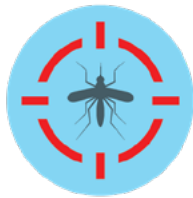
3. a)

Strategy	How it works
Removing stagnant water	Reduces the <i>Anopheles</i> mosquito population by decreasing the number of potential breeding grounds.
Oiling stagnant water surfaces	Reduces mosquitoes' ability to lay larvae and means that larvae cannot emerge from water.
<i>Gambusia</i> (mosquito fish)	Eats the mosquito larvae, therefore reduces population of the vector.
DDT (pesticide)	Kills majority of mosquito population.
Insecticides mixed with paints	Keeps mosquitoes out of people's homes.
Repellents	Reduces the likelihood of being bitten.
Bed nets	Act as a physical barrier to mosquitoes, which is especially useful at night.
Long-sleeved / full-length clothing	Act as a physical barrier to mosquitoes.

b)

Strategy	How it works
Drugs such as quinine and artemisinin	Kills the parasite, breaking the malarial cycle.





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c)

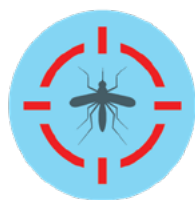
Strategy	How it works
Genetic engineering	One technique creates strains that produce mainly male populations. With less and less females, mosquito populations will also collapse. A second technique affects the fertility of females, again reducing the population.
Satellite monitoring projects, e.g. MARA	Using mapping techniques to monitor “high-risk” areas, helping to make other strategies more effective.

Evaluating Malaria Management Strategies

Students’ responses may vary. A sample response is given below.

Managing the vector		
Strategy	Strengths	Limitations
Removing stagnant water		Not practical or realistic to remove every puddle and small pool of water.
Oiling stagnant water surfaces		Costly and does not work on flowing water.
<i>Gambusia</i> (mosquito fish)	A natural solution and could provide an additional food source for locals.	This may disrupt local ecosystems and food chains. Trials suggest that the fish are not as effective as was hoped.
DDT (pesticide)	Initially very effective (e.g., old WHO campaigns).	Ecosystem affected by buildup of chemical in body tissues through the food chain. Economic costs. Mosquitoes develop resistance.





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Insecticides mixed with paints, e.g., malathion	Insecticide focused where human population is most at risk.	Expensive. People do not like it being used in their homes.
Repellents	Suitable for tourists who can afford them and only have to use thoroughly for a short period.	Expensive, especially for rural areas in less economically developed countries. Have to be used consistently. Do not actually remove the vector.
Bed nets	Highly effective, simple, and relatively cheap. Effectiveness increased if chemically treated.	Less effective in areas where mosquitoes often bite outside, e.g., Southeast Asia
Long-sleeved / full-length clothing	Simple and practical solution.	A degree of discomfort in hot, humid conditions.
Managing the parasite		
Strategy	Strengths	Limitations
Drugs such as quinine and artemisinin	Work well in combination therapies (a mix of drugs). Some are 95% effective.	Parasite's short life cycle has meant that it has consistently developed resistance to drugs. Long-term drug use is expensive.
Latest strategies		
Strategy	Strengths	Limitations
Genetic engineering	Potentially more cost-effective than pesticides	Moral question over genetic engineering. Potential unknown secondary effects through the food chain / ecosystem. Trials will not be fully tested until about 2028.
Satellite monitoring projects, e.g., MARA	Useful given that areas at risk change with fluctuations in weather.	Climate change will require monitoring of endemic areas, which will increase the resources needed.





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Plan of Action

Students' responses will vary.

The best responses will go beyond basic evaluation and will select strategies most appropriate to an LEDC, probably based on cost and effectiveness. Students who think laterally may incorporate some more expensive strategies by encouraging overseas and/or charity aid involvement.

The final paragraph about education is to make sure that students realize that education is always an excellent long-term strategy when dealing with any disease. Students may also refer back to their knowledge about the causes and impacts of malaria in this discussion.

Transcript – For student and teacher use.

