VACCINE DEVELOPMENT

Vaccines are a way of preventing or treating a disease. Vaccine development can sometimes take years to perfect as many steps and several clinical trials must be approved. The virus can use several different methods to prevent a disease. Once a vaccine is produced, often it can be designed to prevent a disease after one dose with a booster possibly years later. Depending on the type of vaccine produced; the ultimate goal is to accustom the body to the pathogen and prevent future infection

PROS:

Being immune to Zika would mean that the number of birth defects would decrease.

Reducing the number of people who are pregnant and susceptible can also help lower the abortion rate in heavily affected areas.

If Zika infection and birth defects are prevented costs associated with birth defects, abortions, tests, and tourism losses can be avoided.

CONS:

Vaccines carry the risk of side-effects which could be worse than birth defects as a result of the disease.

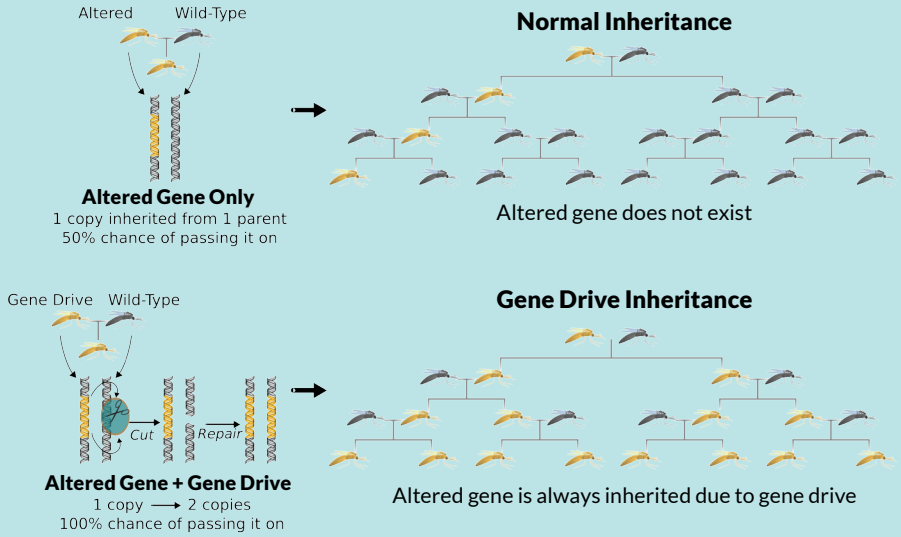
Vaccines take awhile to develop to ensure the safety of the vaccine.

Development can also be extremely costly.

For more information, see the Supplemental Information Sheet on Vaccine Development

Protein Vaccine

Some genes found in nature are more likely to be passed on to offspring. By using elements of these genes, engineers have developed gene drive systems. Genes with gene drives spread through a population quickly over just a few generations.



Kevin Esvelt, MIT Media Lab

CONSIDERATIONS:

Some scientists suggest that we could release a second gene drive that would reverse the first gene drive if something went wrong. This strategy would not completely return the population to "normal" because the genes from the second gene drive would still be present.

Gene drives have been tested successfully in the lab but no mosquitoes with gene drives have ever been released in the wild.

OPTIONS:

One possible gene drive could target the mosquito itself.

For more information, see the Supplemental Information Sheet on Engineered Mosquitoes.

Live Virus Vaccine

TARGET: Mosquito

The gene drive targeting mosquitoes causes sterility to spread through the mosquito population, which reduces the number of mosquitoes.

PROS:

This is likely to permanently reduce the mosquito population. With a small enough mosquito population, Zika cannot be transmitted.

CONS:

This might affect species that eat or interact with that species of mosquito.

This might wipe out São Paulo's entire population of this species of mosquito, which might impact the ecosystem and food chain.

For more information, see the Supplemental Information Sheets on Engineered Mosquitoes and Zika and Traditional Detection Methods.