SYNTHETIC BIOLOGY: Reducing mosquito-borne diseases

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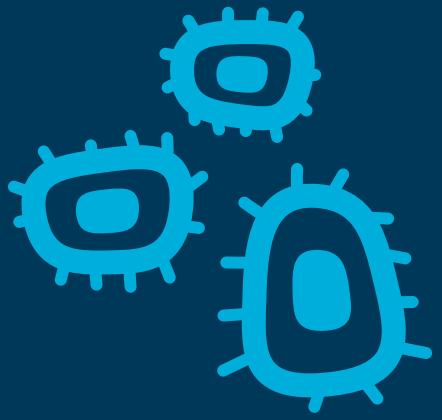
Mosquitos can transmit harmful viruses to humans.

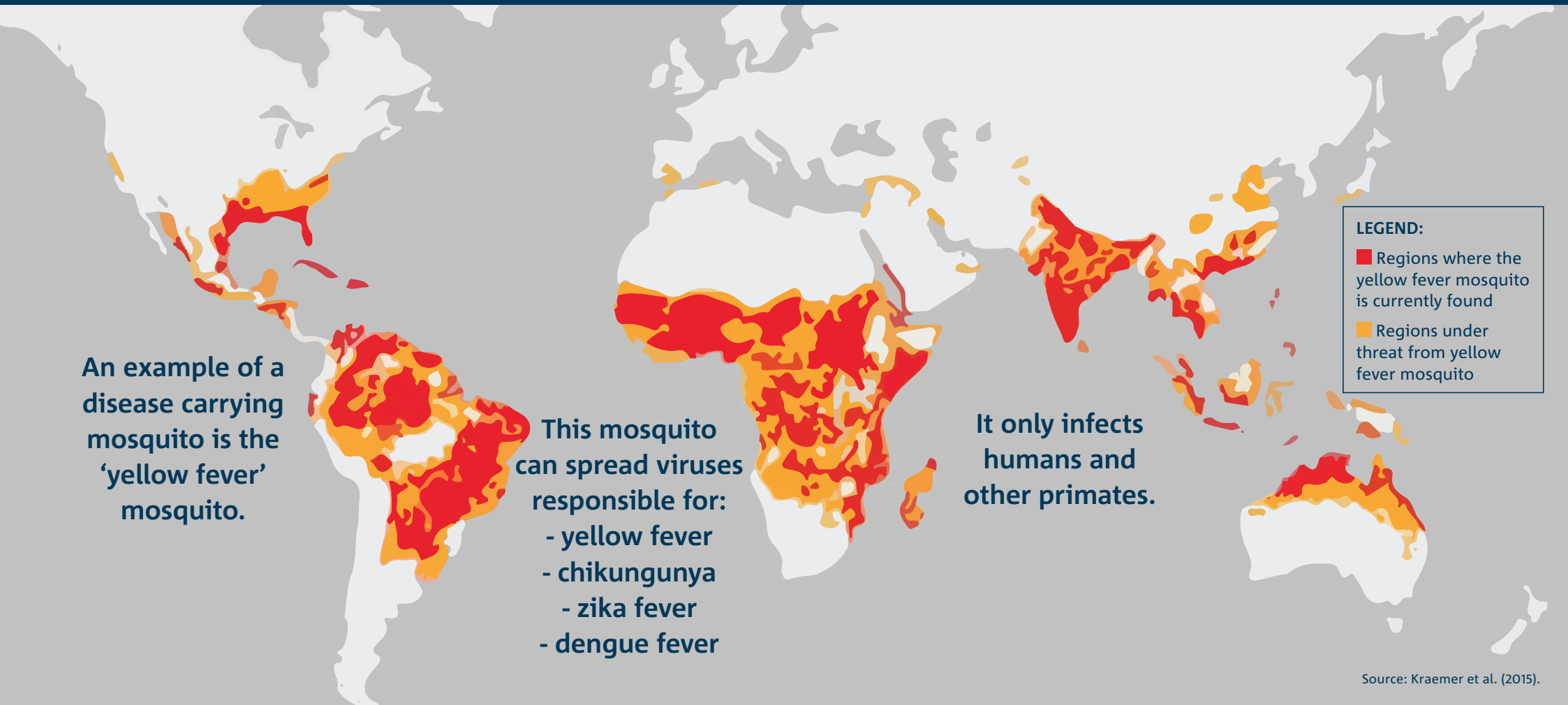


Some examples of mosquito-borne viruses include: malaria, dengue, chikungunya and yellow fever.

These viruses cause severe symptoms (nausea, fever, joint pain, rash) and can be fatal.

Mosquito-borne disease is a significant problem in developing countries. However, Australians can contract these diseases when travelling overseas.

Mosquitos capable of spreading these diseases have also been found in northern parts of Australia.



An example of a disease carrying mosquito is the 'yellow fever' mosquito.

This mosquito can spread viruses responsible for:
- yellow fever
- chikungunya
- zika fever
- dengue fever

It only infects humans and other primates.

Source: Kraemer et al. (2015).

Currently, humans control mosquito-borne diseases by:

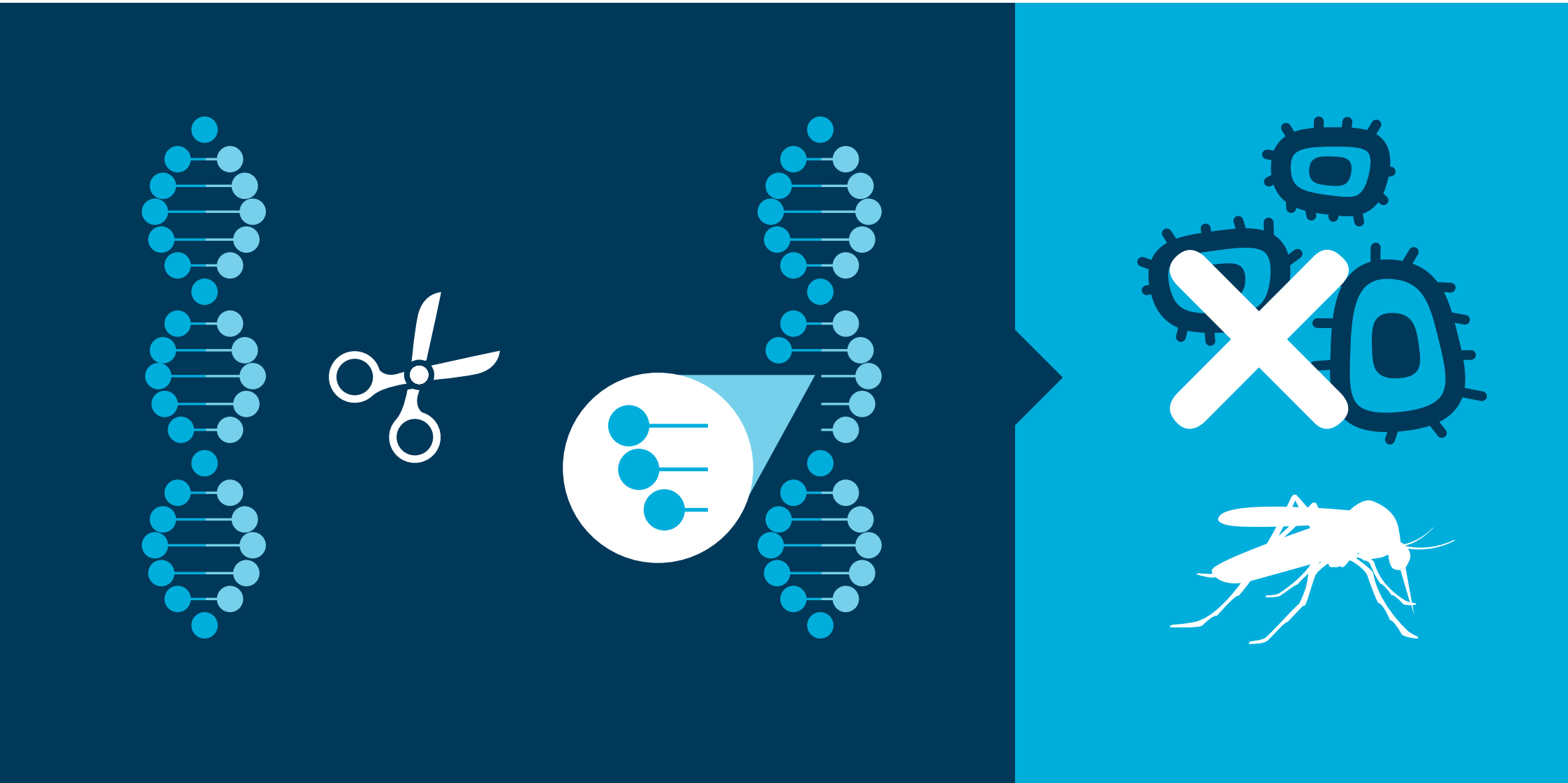
Spraying to reduce mosquito numbers

The use of insecticidal mosquito nets

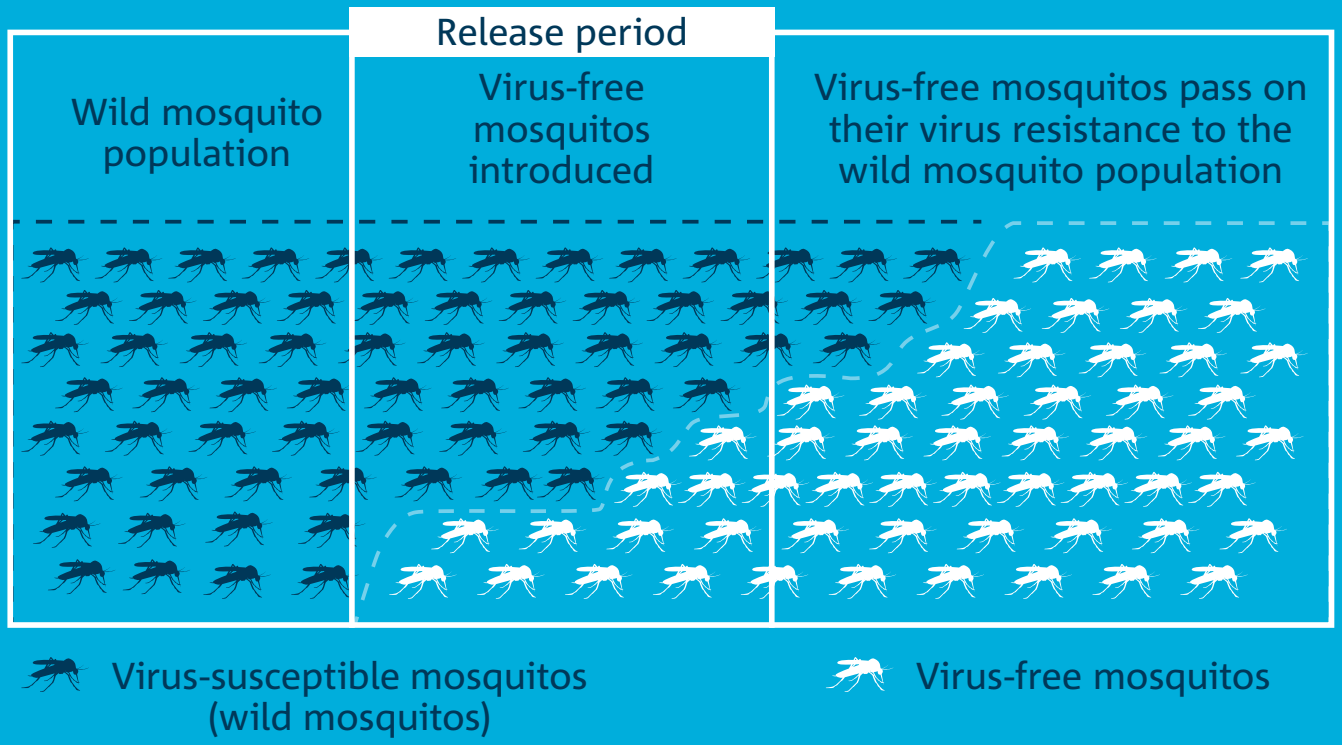
Protective measures (e.g. use of insect repellent, wearing long sleeves)

Unfortunately, for many mosquito-borne diseases, there are no vaccines available to protect humans from catching these viruses.

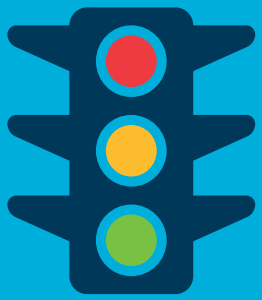
New synthetic biology technology can enable scientists to identify virus-susceptible genes in the mosquito and remove them, producing virus-free mosquitoes.



Virus-free mosquitos could be released into the environment and mix with wild mosquitos, passing on their virus resistance to their offspring.



This technology could significantly reduce the number of people catching mosquito-borne viruses in Australia and throughout the world.



This technology would likely be approved and/or regulated by:

The **Office of the Gene Technology Regulator**

The **Environment Protection and Biodiversity Conservation Act**

The State-based **Department of Agriculture**

Together these regulatory bodies and standards would ensure that:

- The research and development occurs under controlled laboratory conditions, and
- Any environmental, ecological and health risks or concerns are properly reviewed and addressed.

Australian residents like you may have the opportunity to ....

- Take part in public events where scientists share their research on the technology
- Participate in online or face-to-face discussions to ask questions and share your thoughts about the technology
- Sign up to receive regular updates on the technology development