

Issue Brief¹

Issue Title	Self-spreading vaccines for wildlife
Description	<p>Self-spreading vaccines for wildlife are designed to limit the spread of wildlife diseases and potentially reduce zoonotic spillover into humans. These approaches generally involve engineered live viruses or viral vectors designed to spread through a wildlife population to confer resistance to a particular pathogen. In some cases, non-replicating viral vectors are engineered to re-confer vector replication and spread between hosts.</p> <p>Some specific examples include:</p> <ul style="list-style-type: none">• Lassa fever virus vaccines for rodents to prevent transmission to humans• Vaccines to control Rabies in wildlife• Raccoon pox virus vector targeting <i>Pseudogymnoascus destructans</i> pathogens in bat populations
Timeline (<5 years, 5-10 years, >10 years) to environmental release	<p>Less than five years, already in 2019 for some field trials.</p> <p>Technology exists to allow for the accelerated development of vaccines, as shown by the COVID-19 public health crisis.</p> <p>Thus, these applications may have the potential for rapid development. This likely holds true for non-replicating viral applications as well.</p>
Potential impacts on the objectives of the Convention	<ul style="list-style-type: none">• Wide host specificity for some viruses• Rapid spread depending on viral vector• Lack of stability of modified viruses (e.g., viral evolution, recombination)• Horizontal gene transfer

¹ Information gathered from the members of the multidisciplinary Ad Hoc Technical Expert Group on Synthetic Biology. Descriptions complemented with publications published by the Secretariat of the Convention on Biological Diversity.

	<ul style="list-style-type: none"> • Unpredictable effects, such as physiological and ecosystem dynamics • Uncertainty related to pathogen response to vaccine and ability to spill-over to non-target hosts (e.g. poxviruses) • Sustainable use could be impacted if target populations of the vaccine are used by humans
<p>Other considerations</p>	<ul style="list-style-type: none"> • Potential challenges to risk assessment • Potential lack of risk management options (e.g., irreversibility of release) • Increased potential for transboundary movements • Lack of availability of the applications in developing nations • Limited capacity for developing nations to manage unintended outcomes • Implications for free, prior and informed consent of potentially affected indigenous peoples and local communities • Worldview of indigenous peoples and local communities • Dual-use potential • Need to address liability and redress prior to release • Potential for issue to be conflated with human vaccine hesitation and opposition (e.g., misinformation) • Social, political and commercial determinants of health, as well as alternative interventions