

**The risk of rinderpest re-introduction in the post-eradication era**

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Ten years after the last reported outbreak, the global eradication of rinderpest was declared in 2011. However, as rinderpest virus stocks still exist, there remains a risk of rinderpest re-introduction. A semi-quantitative risk assessment was conducted to assess this risk, which was defined as the probability of at least one host becoming infected and infectious outside a laboratory within a one year period. Pathways leading to rinderpest re-introduction were: deliberate or accidental use of virus in laboratories, deliberate or accidental use of vaccines, host exposure to an environmental source of virus, and use of virus for anti-animal biological warfare. The number of virus and vaccine stocks was assessed through a questionnaire survey involving national veterinary authorities and laboratory staff. The probability of pathway steps occurring was estimated through expert opinion elicitation. The risk was modelled as a multilevel binomial process. It was found that 44 laboratories, in 35 countries, currently hold live rinderpest viruses, 16 of which retain field strains. Viruses are still being used for vaccine and reagent production, and for *in vivo* and *in vitro* research. Seventeen countries hold vaccine stocks of up to 4,000,000 doses. The risk estimate ranged from negligible to high, with the median being very low. The accidental use of laboratory virus stocks was the highest risk pathway. Reducing the number of virus stocks and restricting their use, as well as upgrading the laboratories to a higher biosafety level, would effectively decrease the maximum and median risks. Likewise, ensuring that remaining vaccine stocks are not used and are instead destroyed or relocated to a limited number of regional repositories would also have a high impact on these estimates. However, these measures are unlikely to eliminate the risk of rinderpest re-introduction so maintaining response preparedness is essential.