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D: Foot and mouth disease in Scotland: Improving preparedness and outbreak responses		
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(3)



to assess the risks of 12 different recreational activities requiring access to the countryside, including walking, cycling, fishing, stalking deer and shooting birds,



- [3.3] Volkova VV, Bessell PR, Woolhouse MEJ, Savill NJ Evaluation of risks of foot-and-mouth disease in Scotland to assist with decision making during the 2007 outbreak in the UK. *Veterinary Record* 2011; 169:124 [doi: 10.1136/vr.d2715](https://doi.org/10.1136/vr.d2715)
- [3.4] Porphyre T, Auty H, Tildesley M, Gunn G, Woolhouse M Vaccination against foot-and-mouth disease: do initial conditions affect its benefit? *PLOS One* 2013; 8:e77616. [doi: 10.1371/journal.pone.0077616](https://doi.org/10.1371/journal.pone.0077616)
- [3.5] Porphyre T, Rich K, Auty H. Assessing the economic impact of vaccine availability when controlling foot and mouth disease outbreaks, *Frontiers in Veterinary Science* 2018; 5:47. [doi: 10.3389/fvets.2018.00047](https://doi.org/10.3389/fvets.2018.00047)
- [3.6] Barratt AS, Rich KM, Eze JI, Porphyre T, Gunn GJ, Stott AW. Framework for estimating indirect costs in animal health using time series analysis. *Frontiers in Veterinary Sciences* 2019; 6:190 [doi: 10.3389/fvets.2019.00190](https://doi.org/10.3389/fvets.2019.00190)



routinely used to review the relevant VRAs during future outbreaks to

No outbreaks of FMD have occurred during the REF census period. However, the VRAs, which are reviewed every 2 years and updated after lessons learned from UK-wide disease exercises, such as Exercise Blackthorn in 2018 and Exercise Waratah in 2020, have allowed the SG to put in place strategies, protocols and a suite of licenses that will allow better and more transparent decision-making in the event of an outbreak [5.2a]. Furthermore, during the Highly Pathogenic Avian Influenza outbreak in December 2020, our new VRA review toolkit was deployed by APHA to review the pertinent VRAs and to support licencing of essential activities [5.2e].

From an industry perspective, the benefits of these preparedness activities are clear, as described by the Director of Economic Services at Quality Meats Scotland:

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9D=7 0 impact in this field is evident in hY hUa 0 inclusion and significant role in regular national FMD exercises, such as Exercise Rohan in 2015 and Exercise Blackthorn in 2018. In the UK-wide Exercise Blackthorn [5.8], the VRAs on rural access were tested by Defra, SG and APHA in decisions about movement licences and implementation of a Protection Zone, which requires



countries to have an emergency vaccination strategy in place in case of an outbreak [5.10]. Since 2018, our research has been used to inform plans on vaccine stocks after Brexit in the event that the UK can no longer access the European vaccine bank after this time [5.2b]. We have identified the conditions when vaccination is most effective, and the optimal vaccine stocks required. This knowledge could save an average of GBP490,000,000 in direct and indirect costs in severe outbreaks if vaccination is implemented optimally [3.6] and spare up to 950,000 animals from being culled [3.5].

The VRAs have provided a framework to ensure continued high standards of animal welfare during an outbreak. In 2001, approximately 1/3 of the 6,000,000 animals culled were slaughtered for welfare reasons [5.11]. FMD controls that restrict movements meant that animals could not be moved between fields when they had to cross roads or be moved to slaughterhouses. Because of the restrictions, farmers ran out of feed for animals and animals that were ready fortyd6 (est)7.9 u