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# Drivers of Foot and Mouth Disease in cattle at wild/domestic interface: insights from farmers, buffalo and lions

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## Abstract

Humans and domestic animals live increasingly in the proximity of natural areas and wildlife creating hubs for disease transmission. We assessed the risk of foot-and-mouth disease (FMD) transmission associated with space use by domestic cattle and African buffalo (the wild maintenance host), both at risk of predation by African lion, at the interface of natural and communal lands. FMD incidence in cattle was low, but showed a peak in the rainy season when most cattle incursion into the protected area occurred. Because contacts between cattle and buffalo were rare, and interactions among cattle had no influence then, FMD virus may either survive in the environment or be transmitted by other ungulates. Lions used areas few days to few weeks after buffalo, whereas buffalo did not use areas occupied by lions few weeks before. Lions could reduce the spatio-temporal overlap between cattle and buffalo and contribute to the low level of FMD incidence. During the rainy season, herding practices push cattle away from crops into the protected area but not during the dry season when cattle owners may decide to rely on lower quality resources in the communal land to avoid the risks of infection and/or predation in the protected area.

**Keywords:** Africa, Herding practices, Human, wildlife coexistence, Inter, specific contacts, Networks, Space use

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