

# Foot-and-Mouth Disease in the Russian Federation, 1991 – 2020: a retrospective epidemiological analysis

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## Abstract

Our intention in writing this paper is to conduct a retrospective epidemiological analysis of foot and mouth disease (hereinafter referred to as FMD) outbreaks reported in livestock in the Russian Federation from 1991 to 2020. The paper provides space-time patterns of FMD outbreaks and describes risk factors, FMD prevention and control strategies. 97 FMD outbreaks caused by A, O and Asia-1 serotypes were reported in cattle, small ruminants and pigs in the Russian Federation in the study period. These outbreaks were mainly concentrated along the Russian-Chinese border. The analysis reveals a high incidence rate of A and O serotypes, which accounted for 79% of all outbreaks, as well as a trend towards forming time-space clusters in 2005 and in 2013-2019. Sufficient data were collected to identify 9 statistically significant time-space clusters formed by FMD outbreaks: 3 clusters (the FMDV serotype A) lasted 27 - 62 days, 4 clusters (the FMDV serotype O) lasted 6 - 27 days, one cluster (the FMDV serotype Asia-1) lasted 125 days, and a mixed cluster composed of A and O serotypes that lasted 552 days. Risk factors associated with pathogen introduction were underestimated and it undermined biosecurity and biosafety when keeping and moving animals. It has been argued that the underestimation of risk factors is the major cause of outbreaks. Due to it, direct and indirect contacts with carriers, including wild migrating [cloven-hoofed animal](<https://www.multitrans.com/m.exe?s=cloven-hoofed+animal&l1=1&l2=2>), became possible. Based on the work carried out we have come to the conclusion that developing cross-border cooperation is urgently needed to prevent and control FMD.

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