

Classification of Phases and Types of Foot-and-Mouth Disease Outbreak and Response



Overview

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Foot-and-Mouth Disease



Introduction

Foot-and-Mouth Disease in the US

- The size, structure, efficiency, and extensive movement inherent in the United States and North American livestock industries will present unprecedented challenges in the event of a foot-and-mouth disease (FMD) outbreak.
- Strategies for the response to, and management of, an FMD outbreak will change as the outbreak progresses and will depend upon the magnitude, location, other characteristics of the outbreak, and vaccine availability.

Types and Phases of FMD

- Pre-defined phases and potential types of an FMD outbreak facilitates development of adaptable emergency response and business continuity plans for the U.S. livestock industry.
 - Phase: a temporal stage in an FMD outbreak response
 - Type: a categorical measure of magnitude of an FMD outbreak and its response.
- The phase and type of the FMD outbreak is expected to change over time and could be designated by the authorities responsible for managing the response.

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Phases

Phases of FMD Response

Heightened Alert Phase: FMD Outbreak in either Canada or Mexico, but not U.S.

Phase 1: From confirmation of the first case of FMD in the U.S. until reasonable evidence to estimate outbreak extent.

Phase 2: Surveillance and epidemiology provides timely evidence of outbreak extent to support decisions by Incident Command.

Phase 3: Recovery: surveillance and epidemiology indicates FMD is under control; plan implemented to recover disease-free status.

Phase 4: U.S. declared free of FMD, possibly with vaccination.

Phase 1

- The period of time from the confirmation of the first FMD case in the U.S. until there is reasonable evidence to estimate the extent of the outbreak.
- The transition to Phase 2 should be accomplished as soon as possible, with a goal of less than 4 days (96 hours).

Phase 2

- Surveillance and epidemiology provides timely evidence of the extent of the outbreak (characterized as one of six types) to support planning and decision making by Incident/Area Command.

Phase 3

- Recovery: Surveillance and epidemiologic evidence indicates that the outbreak is under control and a plan is implemented to regain FMD-free status (possibly with vaccination).

Phase 4

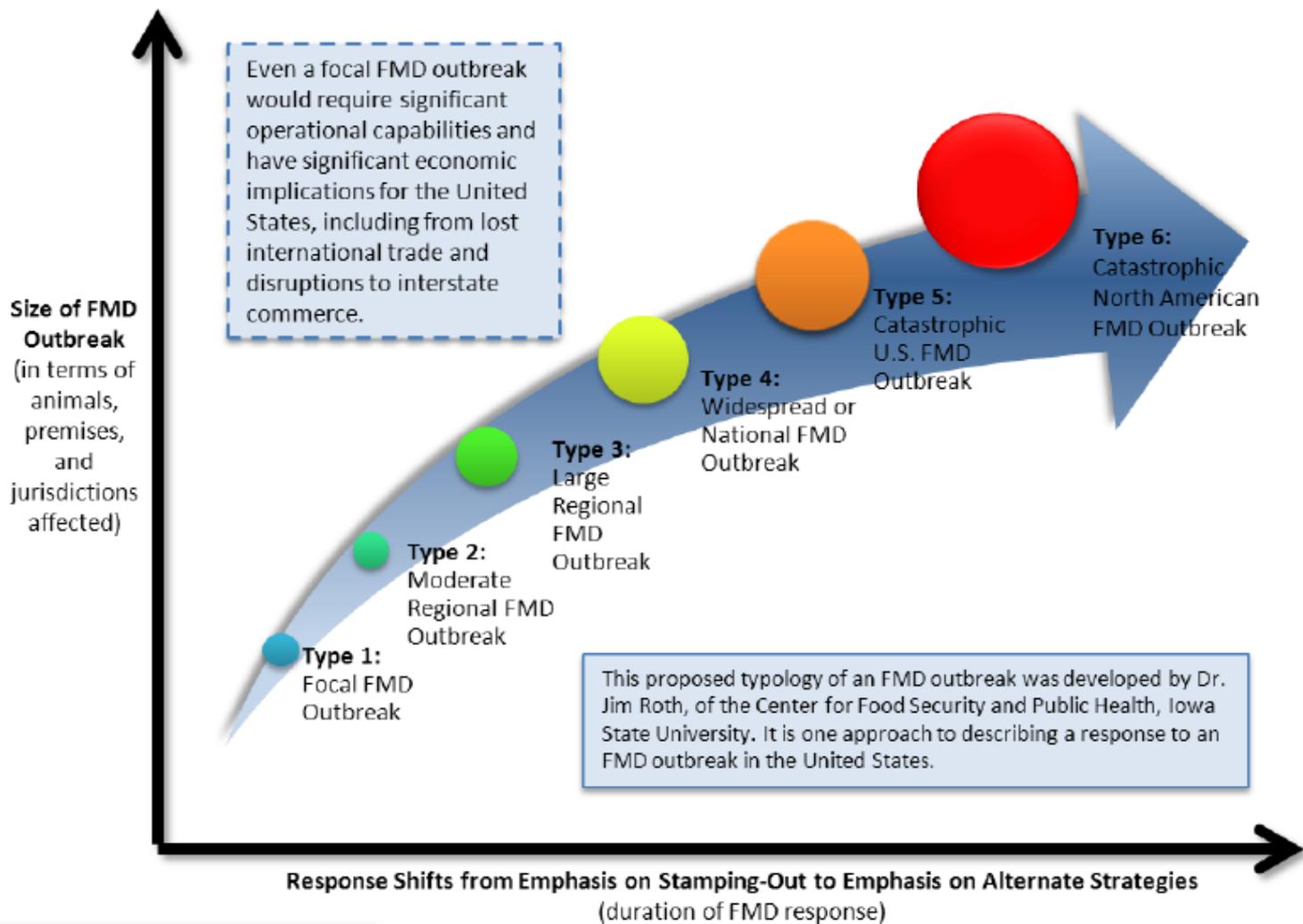
- The U.S. is declared free of FMD (possibly with vaccination). The USDA continues to work to convince trading partners to accept U.S. exports of animals and animal products.

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Types

Types of FMD Outbreaks



Type 1: Focal FMD Outbreak

- Limited to one State or small region with low to moderate livestock numbers on relatively small premises.
- The Infected Premises (IP) have not had extensive animal movement and are not too large to depopulate quickly.
- Rapid stamping-out is feasible.

● Type 2: Moderate Regional FMD Outbreak

- A few focal areas of infection limited to a region with low to moderate livestock numbers on small to medium size premises.
- Depending on animal density, sufficient vaccine and resources can be made available to vaccinate designated susceptible domestic animals to reduce virus transmission.

● Type 3: Large Regional FMD Outbreak

- Multiple areas of infection are detected in a region, or the type, number and/or size of infected.
- Contact herds are too great to depopulate quickly enough to suppress disease spread.
- May not be sufficient vaccine and resources available to vaccinate designated susceptible domestic animals to reduce virus transmission.
- A vaccinate-to-slaughter and/or vaccinate-to-live strategy may be needed.

Type 4: Widespread or National FMD Outbreak

- Widespread areas of infection are detected involving too many herds or herds that are too large to depopulate quickly enough to suppress disease spread.
- Sufficient vaccine and resources are not available to vaccinate all designated susceptible domestic animals in the affected regions (Control Areas).
- The number of vaccinated animals is too great to consider a vaccinate-to-kill or slaughter (only) policy.

● Type 5: Catastrophic FMD Outbreak

- Widespread areas of infection are detected involving a large portion of the U.S.
- Sufficient vaccine and resources are not available to quickly vaccinate all designated susceptible animals in the affected regions.
- The number of animals is too great to consider only a vaccinate-to-kill or vaccinate-to-slaughter strategy in isolation.
- It becomes apparent that FMD is widespread, and will not be eradicated within a year.

● Type 6: North American FMD Outbreak

- Widespread areas of infection are detected involving a large portion of the U.S., Canada, and/or Mexico.
- Sufficient vaccine and resources are not available to quickly vaccinate all designated susceptible animals in the affected regions/countries.
- The number of vaccinated animals is too great to consider a vaccinate-to-kill policy.

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Critical Activities

Critical Activities in the First 72 Hours of an FMD Outbreak



0–24 Hours

Presumptive positive detection of FMD in the United States.

- Establish quarantine, hold orders, movement restrictions, and standstill notices (e.g., 24–72 hours) for relevant zones and regions.
- Initiate appraisal process.
- Begin depopulation activities.
- Notify States, industry, trading partners, media.
- Implement increased biosecurity measures.
- Start tracing activities (epidemiological investigation).
- Begin confirmatory diagnostics and further virus typing.
- Initiate incident management organizational structures and processes.
- Decide to deploy Incident Management Team (IMT) to field.
- Begin data collection and information management in Emergency Management Response Services (EMRS) 2.0.
- Initiate virus identification for an FMD vaccine.

24–48 Hours

- Evaluate quarantine and movement controls.
- Continue depopulation and disposal activities.
- Ensure compensation process moves forward for indemnity.
- Proceed with surveillance and tracing activities.
- Execute timely and accurate data entry in EMRS 2.0.
- Initiate public awareness messaging and communication campaign.
- Implement and enforce increased biosecurity measures.
- Initiate continuity of business plans.
- Continue confirmatory diagnostics.
- Prepare for arrival of IMT with affected State.
- Continue virus identification for an FMD vaccine.

48–72 Hours

- Continue ramping up Incident Command and Incident Coordination Group.
- Ensure compensation process proceeds.
- Continue any ongoing depopulation and/or disposal activities.
- Continue timely and accurate data entry in EMRS 2.0.
- Continue surveillance and tracing activities.
- Implement and enforce increased biosecurity activities.
- Continue public awareness campaign.
- Ramp up permitting and continuity of business activities.
- Continue agent identification for an FMD vaccine (as appropriate).
- Evaluate the implementation of emergency vaccination strategies.

Use of appropriate critical activities and tools continues throughout FMD response.

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Disease



Response Strategies

Overview of FMD Response Strategies

Strategy or Strategies	Definition of Strategy	Likelihood of Use	Example of Application
Stamping-Out (No Emergency Vaccination)	Depopulation of clinically affected and in-contact susceptible animals.	Possible (if outbreak is contained in jurisdictional areas in which FMD can be readily contained and further dissemination of the virus is unlikely).	Stamping-out Infected Premises.
Stamping-Out Modified with Emergency Vaccination to Kill	Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, with subsequent depopulation and disposal of vaccinated animals. Depopulation and disposal of vaccinated animals may be delayed until logistically feasible, as determined by Incident Command and the VS Deputy Administrator (U.S. CVO).	Possible (if outbreak is contained in jurisdictional areas in which FMD can be readily contained and further dissemination of the virus is unlikely).	Stamping-out Infected Premises, emergency vaccination to kill within the selected areas of the Buffer Zone in Containment Vaccination Zones.

Response Strategies, continued

Strategy or Strategies	Definition of Strategy	Likelihood of Use	Example of Application
Stamping-Out Modified with Emergency Vaccination to Slaughter	Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, with subsequent slaughter of vaccinated animals if animals are eligible for slaughter under USDA Food Safety and Inspection Service authority and rules and/or State and Tribal authority and rules.	Highly likely (depending on the type of the FMD outbreak).	Stamping-out Infected Premises; emergency vaccination to slaughter within the Control Area in Containment Vaccination Zones.
Stamping-Out Modified with Emergency Vaccination to Live	Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, without subsequent depopulation of vaccinated animals. Vaccinated animals intended for breeding, slaughter, or other purposes live out their useful lives.	Highly likely (depending on the type of the FMD outbreak).	Stamping-out Infected Premises; emergency vaccination to live outside of the Control Area in Protection Vaccination Zones.
Combination of Stamping-Out Modified with Emergency Vaccination to Kill, Slaughter, and Live	Combination of emergency vaccination to kill, slaughter, and live.	Highly likely (depending on the type of the FMD outbreak).	Stamping-out Infected Premises; emergency vaccination to slaughter within the Control Area in Containment Vaccination Zones and emergency vaccination to live outside of the Control Area in Protection Vaccination Zones.

Response Strategies, continued

Strategy or Strategies	Definition of Strategy	Likelihood of Use	Example of Application
Vaccination to Live (without Stamping-Out)	Vaccination used without depopulation of infected animals or subsequent depopulation or slaughter of vaccinated animals.	Less likely (unlikely to be implemented at start of outbreak).	No stamping-out Infected Premises; Vaccination to live outside of the Control Area in Protection Vaccination Zones.
No Action	FMD would take its course in the affected population; other measures may be implemented to control and contain FMD spread.	Unlikely.	Quarantine and movement control measures; biosecurity measures; cleaning and disinfection measures implemented. No stamping-out and no vaccination.