



Food and Agriculture
Organization of the
United Nations

SUSTAINABLE
DEVELOPMENT
GOALS



Risk of foot-and-mouth disease SAT2 introduction and spread in countries in the Near East and West Eurasia

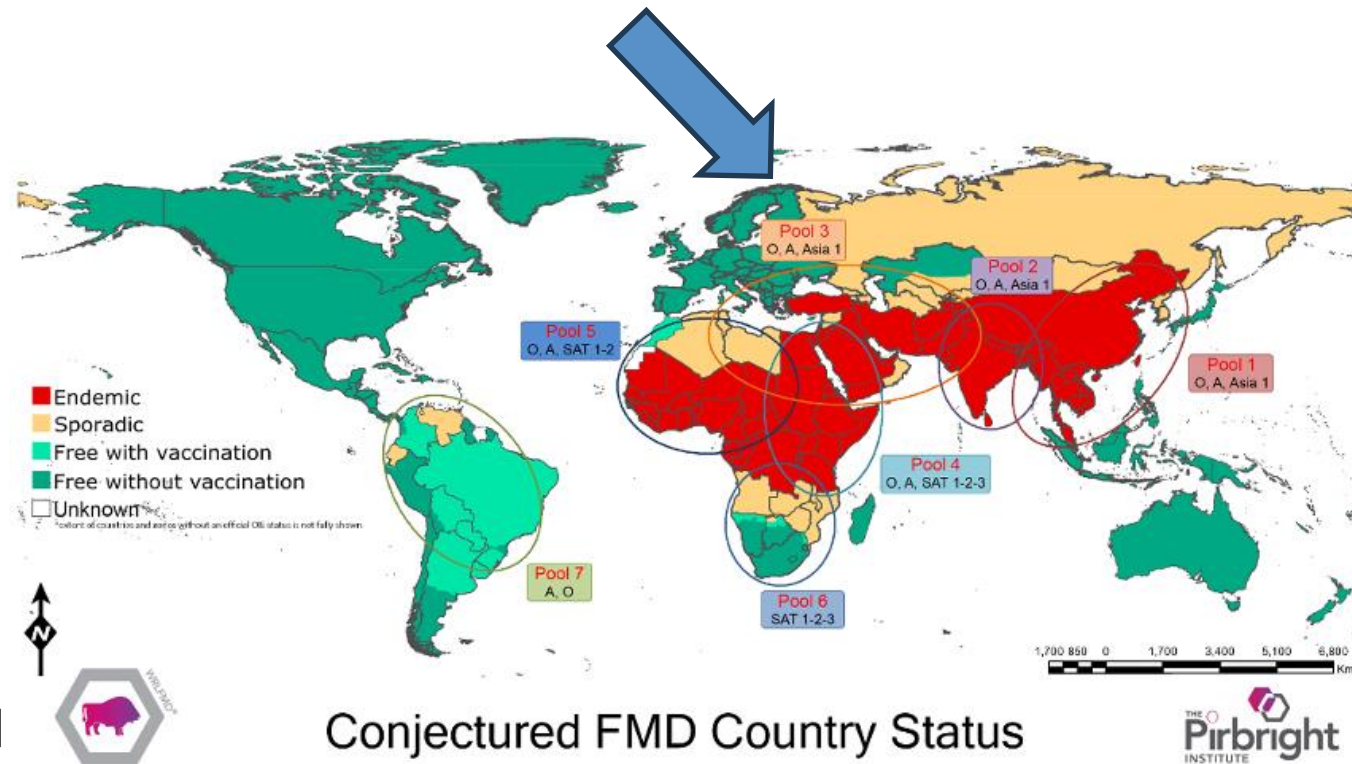
Melissa McLaws, Bouda Vosough Ahmadi, Akiko Kamata, Muhammad Arshed,
Andriy Rozstalnyy, Fabrizio Rosso and Madhur Dhingra

Working for  #ZeroHunger



Background

- W. Eurasia Roadmap countries are in FMD virus pool 3
 - Serotypes O, A, Asia 1 circulate
 - Many animals will have full or partial immunity to these serotypes through prior infection, maternal immunity and/or vaccination
- Increase in FMD cases noted in December 2022 in Iraq and Jordan
 - Samples from Iraq tested in Türkiye
 - SAT2 serotype reported in Feb 2023 in Iraq and Jordan, and later in Türkiye and Oman
 - Topotype XIV, most closely related to a strain detected in Ethiopia in 2022





Background

- SAT2 of high concern because animals lack immunity and vaccines used in region not effective for this serotype
- FAO issued an **alert** on 10th February 2023 to raise awareness
- Series of 3 **webinars** held in March 2023 for countries in the region
 - Update on SAT2
 - FMD laboratory diagnostics
 - SAT2 risk management and vaccination strategies
- Series of **coordination meetings** held with countries
- Emergency **mission** to Iraq in June 2024 on request of the Iraqi authorities

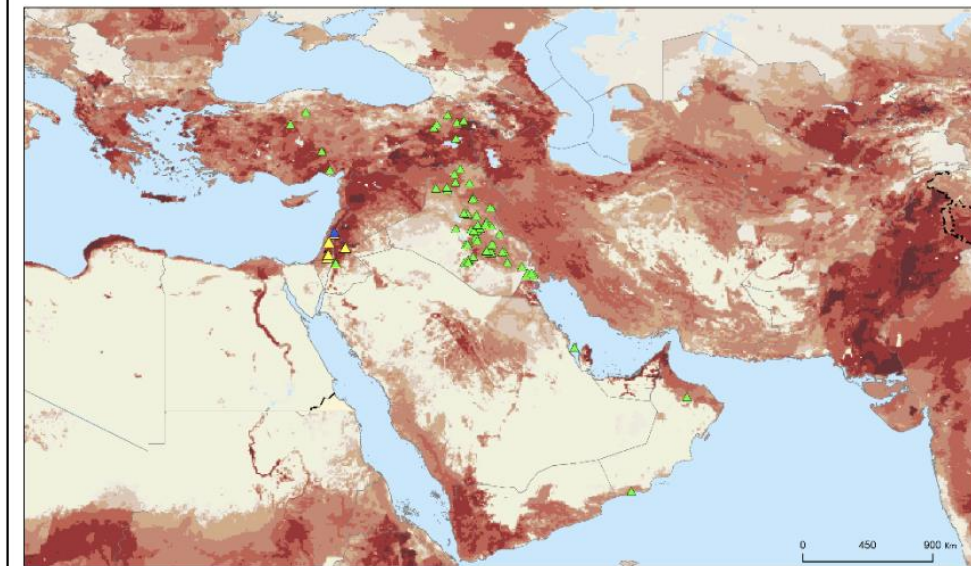


alert



FAO ALERTS COUNTRIES IN THE MIDDLE EAST AND WEST EURASIA TO ENHANCE PREPAREDNESS FOR FOOT-AND-MOUTH DISEASE

10 February 2023



Distribution of small ruminants (head per km², 2015)

< 1	5-10	20-50	100-250
1-5	10-20	50-100	> 250

FMD outbreaks 1 December 2022-31 August 2023

▲ SAT2 serotype	▲ Not typed/pending
▲ O serotype	



Risk Assessment Methodology

- Qualitative risk assessment performed to analyse risk (=likelihood + consequences) of further spread
- Why qualitative versus quantitative?
 - Qualitative is appropriate for faster analysis, lack of reliable data

Steps followed:

1. Define the risk questions
2. Identify and draw the relevant risk pathways
3. Collect data for the analysis
 - ✓ Questionnaire to vet services
 - ✓ Literature
 - ✓ Databases (eg FAO STAT)
4. Model economic impact using 5 scenarios



Risk of foot-and-mouth disease SAT2 introduction and spread in countries in the Near East and West Eurasia



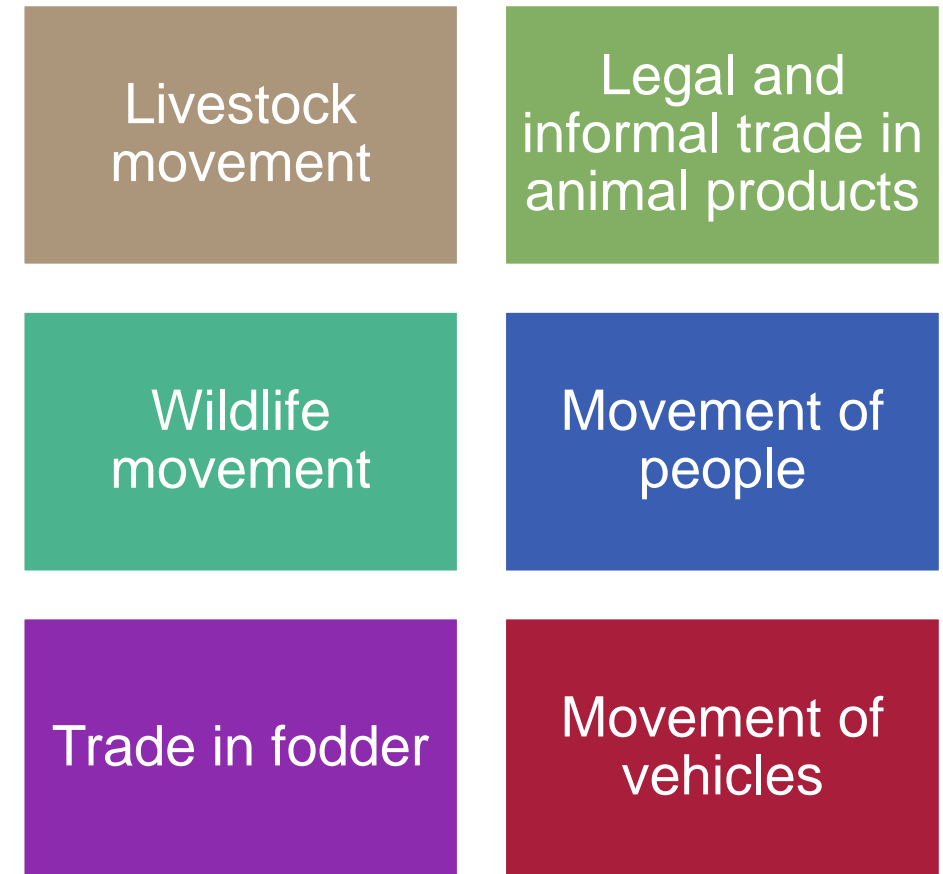


Methodology

Risk Questions:

1. What is the **likelihood** of FMD-susceptible livestock in unaffected countries being **exposed** to FMD serotype SAT2 due to its introduction from affected countries* via the specified pathways?
 - *Affected countries at the time of the analysis: Iraq, Jordan, Oman and Türkiye
2. What is the **potential impact** of FMD-susceptible livestock being exposed to FMD serotype SAT2:
 - in unaffected countries?
 - in countries already affected?

Risk Pathways



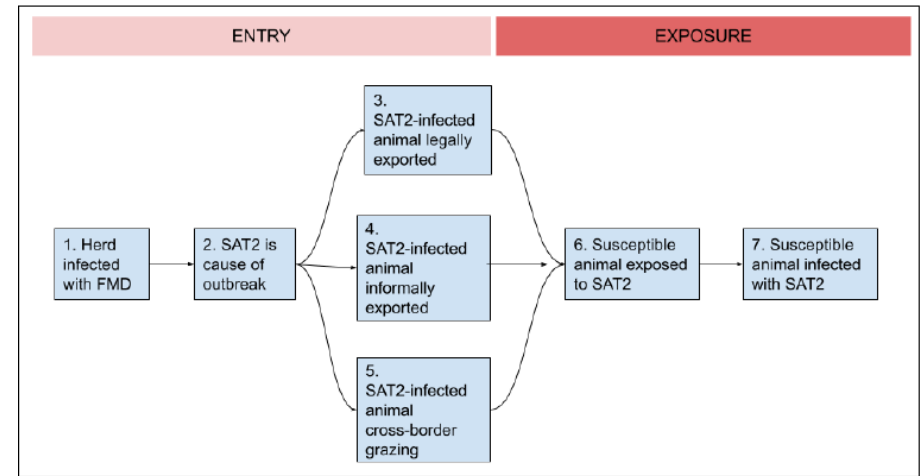


Results

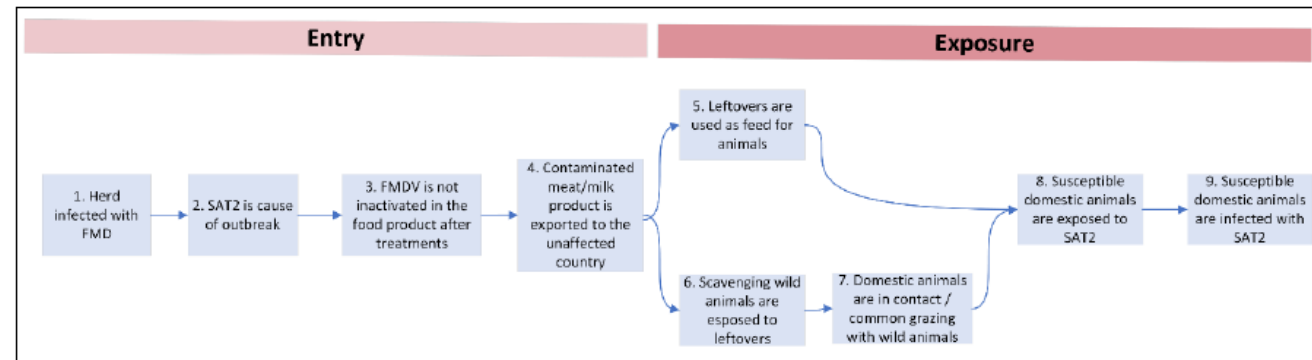
Likelihood of spread

- **Informal movements** of livestock and common grazing are most likely pathway for spread of SAT2
 - Effective mode of transmission
 - Absence of sanitary measures
 - Peaks in seasonal risk (eg Eid al-Adha (qurban))
- **Animal products** less likely:
 - Although the countries are highly connected by trade, this pathway usually involves pigs consuming product, and there is little pig production in the region

Live Animal Movement Risk Pathway



Animal Product Risk Pathway





Results

Likelihood estimates per country/territory and risk pathway addressed

Likelihood of spread

- Other pathways are possible in some cases, but less likely:
 - Less effective transmission routes (indirect, via fomites)
 - Involve many more steps – the more steps are involved the less likely the event will occur
- Several data gaps, therefore high uncertainty in the analysis

Country/ Territory	Live animals			POAO	Wildlife (boar)	Fodder	People	Vehicles
	Official trade	Informal trade	Common grazing	Official trade		Official trade		
Armenia	N	N	N	N	L	N	N	N
Azerbaijan	L	M	N	L	L-N	N	N	L
Bahrain	L	NA	NA	N	N	N	NA	L
Bulgaria	N	L	N	N	L-N	L-N	L	L
Cyprus	N	N	N	N	N	N	N	N
Georgia	N	N	M	L	L	N	L	L
Greece	N	N	N	N	L-N	N	L	N
Iran (the Islamic Republic of)	L	NA	H	N	L	N	NA	L
Iraq								
Israel	N	N	N	L	L	N	N	N
Jordan								
Kuwait	N	N	N	N	N	L-N	N	L
Lebanon	N	N	N	L	L-N	L-N	N	L
Oman								
Qatar	L	NA	NA	N	N	L-N	NA	L
Saudi Arabia	L	NA	NA	N	N	L-N	NA	L
Syrian Arab Republic	N	H	N	L	L	N	L	L
Türkiye								
UAE	L	M	N	N	N	L-N	L	L
West Bank	N	N	N	L	L	N	L	N
Yemen	N	N	H	N	N	L-N	N	L

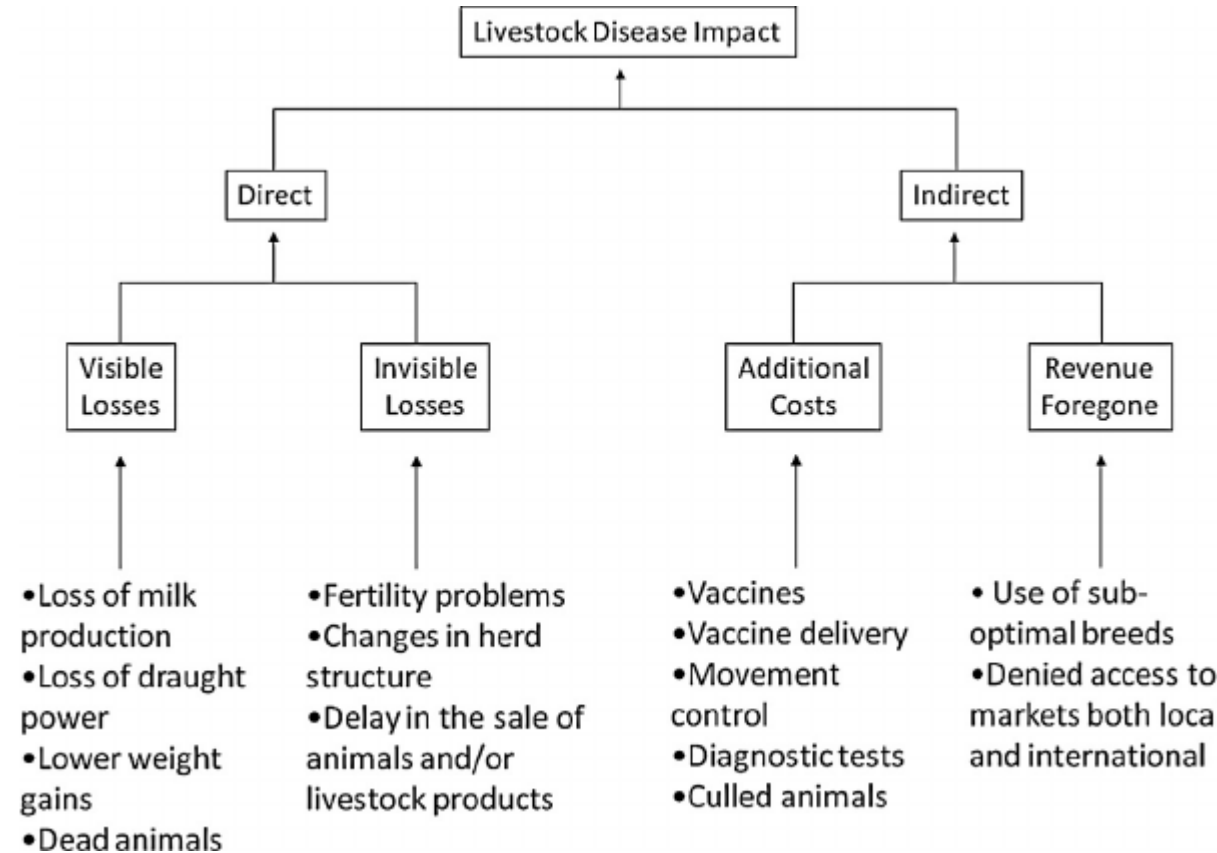
H = high, M = Moderate; L = Low; N = Negligible; NA = Not assessed. **Blue cells: high uncertainty.** Green cells: moderate uncertainty. The red font indicates that countries did not respond to the questionnaire survey.



Results

Consequences

- SAT2 incursion has direct and indirect impacts
- Model direct impacts and control costs thru 5 scenarios:
 1. no further spread; known affected countries only: Jordan, Iraq, Oman, Türkiye
 2. westward spread to FMD-free countries
 3. eastward spread to countries neighbouring Anatolia
 4. spread to countries neighbouring Iraq
 5. widespread in all 20 countries: worst-case scenario.



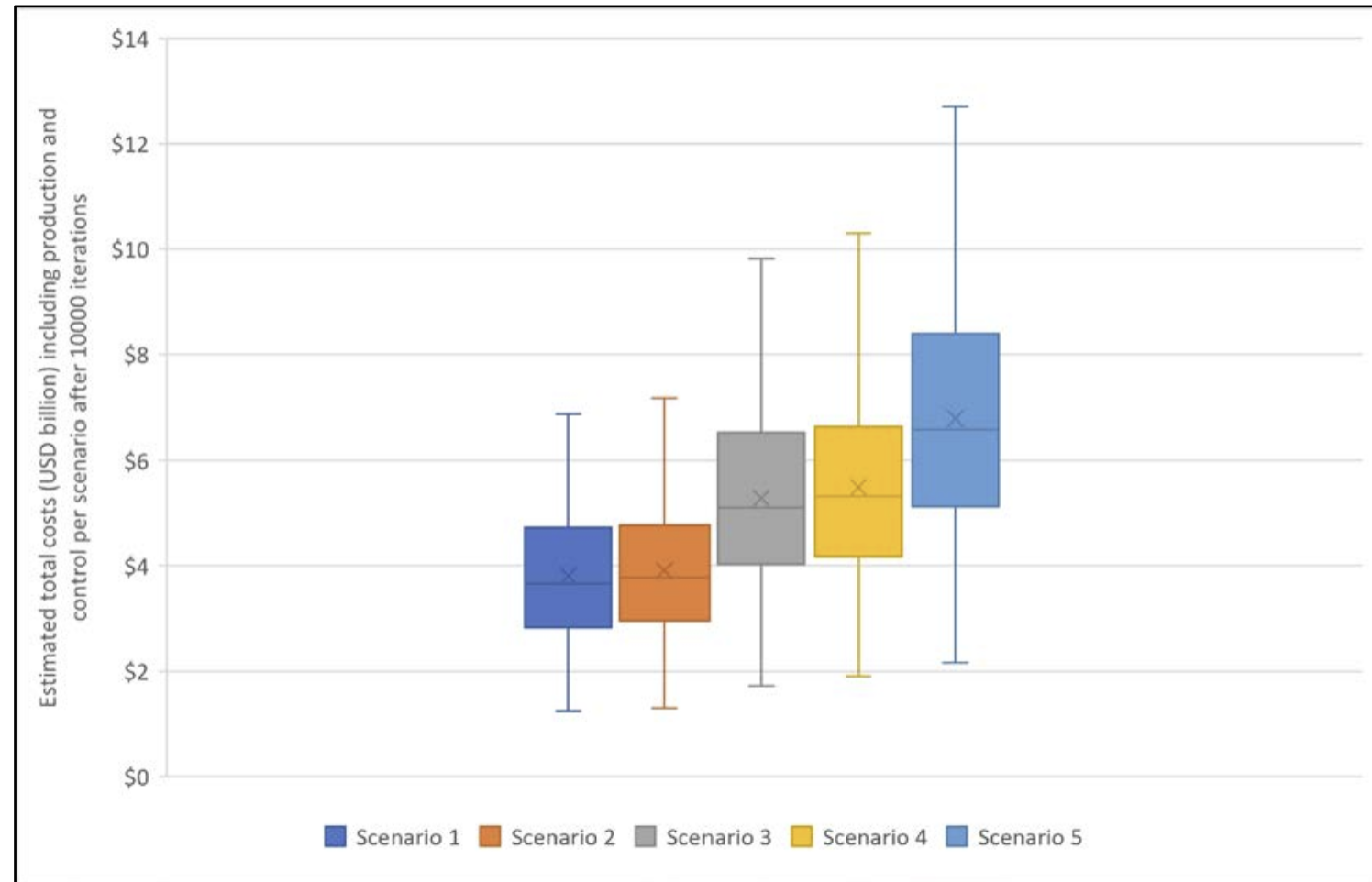


Results

Consequences

- Estimated costs varied from USD 3.6 – 6.5 billion
- Production losses are 95% of total costs
- 4 countries with highest level of production represent ~80% of losses
- Additional impacts related to food and nutrition security

Figure 10. Variation in estimates total costs (USD billion) per scenario after 10 000 iterations





Conclusions and recommendations

- Qualitative risk assessment useful framework to guide prevention and response activities
- An outbreak of **FMD SAT2** would have a **substantial negative** impact in all countries considered in this risk assessment, though to a varying extent in terms of the level of impact and sector most affected
- The likelihood of exposure, **infection and spread can vary over time or change seasonally** - Eid al-Adha, winter/early spring
- As resources are always limited, **prevention should be risk-based** and targeted to specific areas, holdings and the highest risk pathways





Conclusions and recommendations

- Ensuring that **only healthy animals (known to be FMD-free) are moved** is crucial to mitigate the risk of FMD spreading within and between countries
- Trade between countries could be made safer by facilitating **compliance with the official trade regulations**, which in turn would help ensure that sanitary measures are applied.
- **Raising awareness** about FMD prevention is also crucial, as this will enable stakeholders to better protect their livestock and livelihoods.

Transaction in a livestock market – how can they be sure the cattle are healthy?





Conclusions and recommendations

All countries **should have an emergency response plan** for FMD that details how to manage a sudden increase in cases, such as would be expected with the introduction of a novel serotype such as SAT2.

The response plan needs to be:

- **realistic** for the country
- **supported with adequate resources** for implementation when needed,
- **should be tested** through regular and realistic simulation exercises.



Good emergency management practice: The essentials

A guide to preparing for animal health emergencies
Third edition

FAO ANIMAL PRODUCTION AND HEALTH / MANUAL 25



Available at:

<https://web.archive.org/web/20210610105243/http://www.fao.org/3/cb3833en/cb3833en.pdf>



Food and Agriculture
Organization of the
United Nations

SUSTAINABLE
DEVELOPMENT
GOALS



Conclusions and recommendations

- Implement an **early warning system** based on reports of increased mortalities (particularly young stock) and observations at slaughterhouses or panic sales, using information from farmers, traders, para-veterinary workers, inspectors and relevant social media sites.
- Support and **improve the performance and infrastructure of veterinary services**
- **Adopt Public-private partnership** approaches when appropriate



© FAO/Tofik Babayev



Acknowledgements

Experts:

- Donald King - WRL- FMD
- Prof Eyal Klement - The Hebrew University
- Manuel Sanchez-Vazquez - PANAFTOSA/VPH
- Sergei Khomenko

FAO reviewers:

- Eran Raizman
- Mario Zappacosta

FAO Regional Office for Europe and Central Asia

FAO Subregional Office for the Gulf Cooperation Council states and Yemen



Food and Agriculture
Organization of the
United Nations

SUSTAINABLE
DEVELOPMENT
GOALS

THANK YOU



Protecting people, animals, and the environment every day