Federation of Veterinarians of Europe

IZSAM G.CAPORALE TERAMO

CESME Centro di Referenza Nazionale

Is Crimean-Congo Haemhorragic Fever (CCHF) becoming and emerging risk in Italy?

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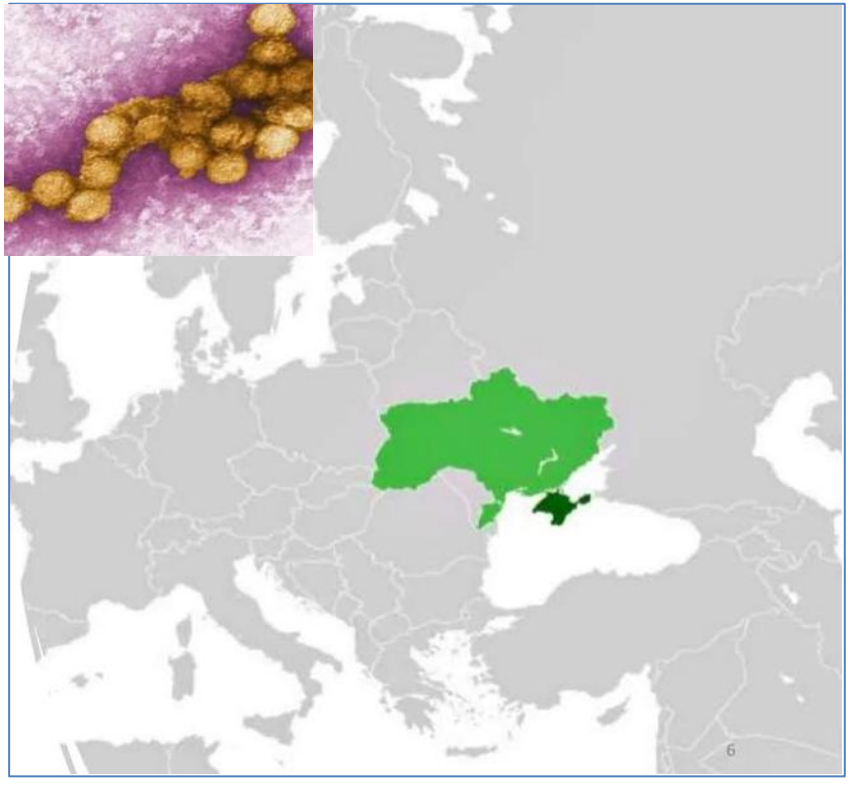
34th Stakeholder Discussion Group on Emerging Risk (StaDG-ER). 25-26 November 2025

Vector-Borne diseases (VBD)

- VBD represent a major public health problem
  - 80% of the world's population is currently at risk of contracting one or more VBD responsible for the deaths of over half a million people each year.
- Climate change contribute to the emergence and persistence of VBD
  - warmer temperatures and changes in precipitation patterns have extended the range and seasonality of the vector (ticks) thereby increasing the risk of human and animal exposure

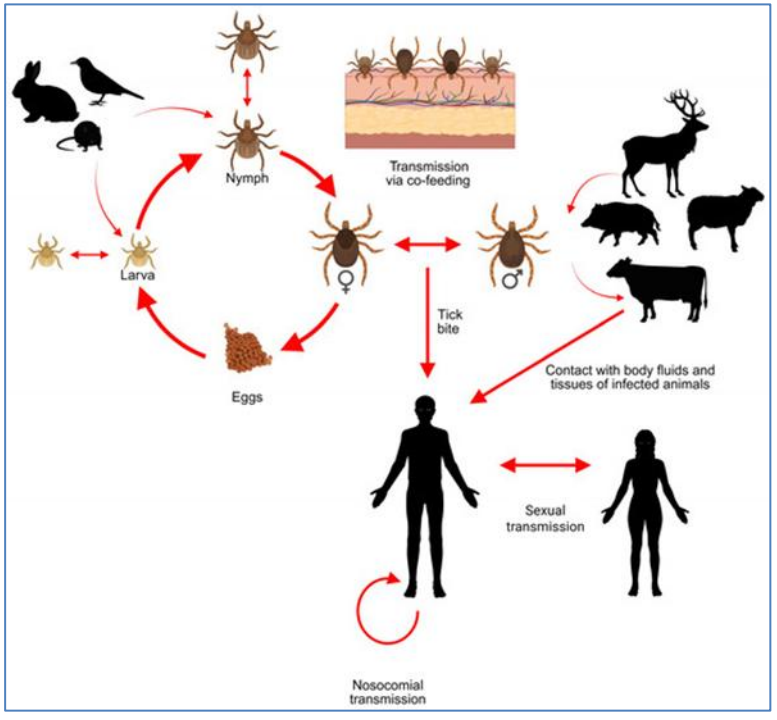
Crimean-Congo Hemorrhagic Fever (CCHF)

- severe tick-borne viral zoonotic disease caused by Crimean-Congo hemorrhagic fever virus (CCHFV)
- Genus *Orthonairovirus,* family *Nairoviridae:* extensive genetic diversity from different geographic regions
- 1944
  - first described in Crimea
  - Soviet military personnel
- 1969
  - also detected in Congo
- Potential bioterrorist agent

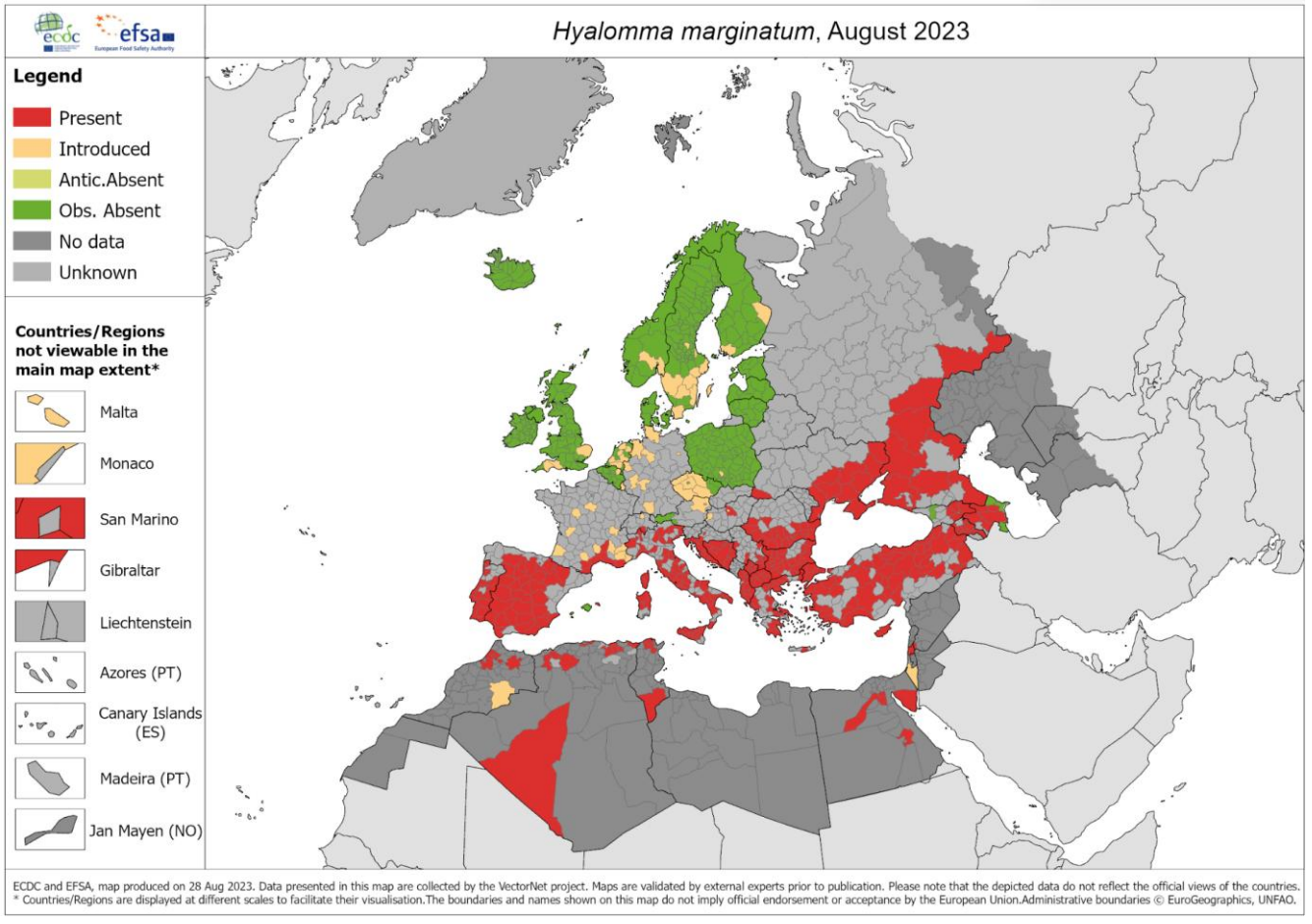


Transmission

- Primary vector: Ticks of the genus *Hyalomma*
- the cycle involves ticks and vertebrate: asymptomatic in wild and domestic animals
- Cattle, goats, sheep and hares can act as amplifying host for the virus
- Transmission to humans occurs through tick bite or direct contact with blood of infected ticks, direct contact with blood/tissues of infected animals and livestock.



Distribution of *Hyalomma marginatum*



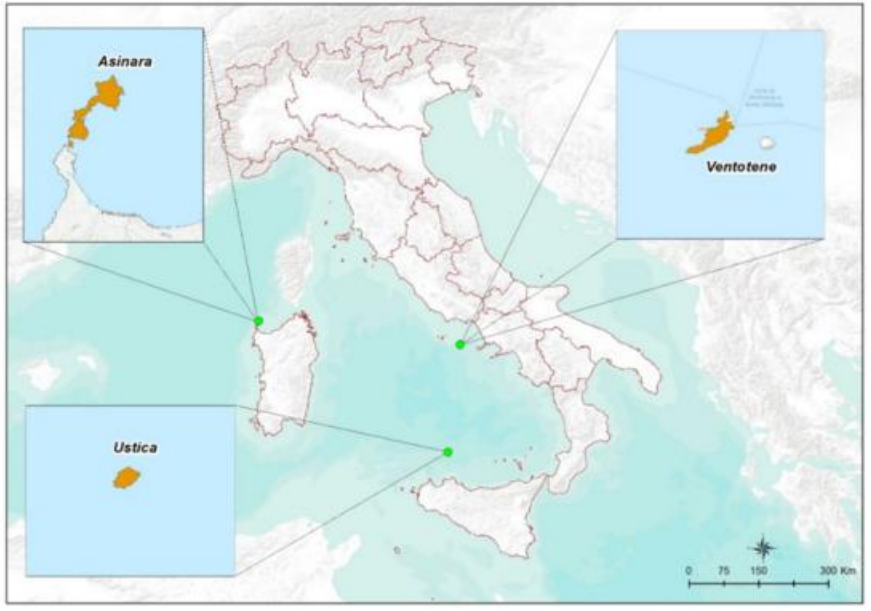
The Role of Migratory Birds

- migratory birds could contribute to the spread of African ticks and tick-borne pathogens further raising potential public health concerns across Europe.
- risk of CCHF emergence in Italy due to the new climatic and environmental conditions, the presence of endemic competent vector species, and its location in the middle of the Mediterranean area
- the CCHFV genome has been recently detected in a tick collected from a bird in Italy

https://doi.org/10.3390/pathogens11091056.

The Role of Migratory Birds

- three-year study by collecting ticks from birds and free-living ticks on the stop-over islands during the spring migration seasons
- evidence of an active roles of migratory birds in the diffusion of CCHFV-infected ticks into European countries during spring migration
- CCHFV RNA was detected for the second time in Italy in a *Hyalomma rufipes*



https://doi.org/10.3390/pathogens11091056.

Crimean-Congo Hemorrhagic Fever (CCHF)

- Although not listed in Regulation (EU) 2018/1882, is nevertheless of certain importance for veterinary public health.
- WHO classified CCHF as a priority disease (associated with high case fatality risk, lack of effective vaccines and specific treatment)
- WOAH: CCHF is a notifiable disease and as arthropod-borne viral zoonosis is subject to epidemiological surveillance (Directive 2003/99/EC, Annex 1)
- possible appearance in new geographical areas would also qualify it as an emerging disease pursuant to Article 6 of Regulation (EU) 2016/429.

Clinical presentation

- Incubation: 1–3 days (tick bite) vs. 5–6 days (blood contact)
- Pre-hemorrhagic phase: sudden high fever, myalgia, dizziness, neck pain, stiffness, photophobia.
- Hemorrhagic Phase (starts day 3-5): petechiae, large ecchymoses, epistaxis, hematemesis, melena.
- Severe complications: hepatorenal failure, Multi-Organ Dysfunction Syndrome (MODS).
- Some patients may experience mood swings, confusion, and aggressiveness.

NICD South Africa/R. Swanepoel

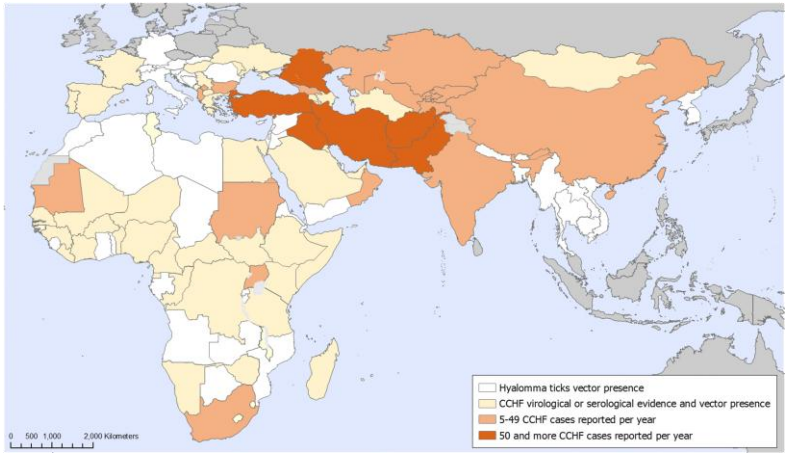
Morbility and Mortality

- 88% of infections are subclinical (1/8 people will develop a severe disease)
- CFR: 30-50% (severity)
- mortality rate: 10-80% (highest after tick bite)
- occupational exposure is critical for farmers and slaughterhouse workers
- recreational exposure (hiking, camping)
- nosocomial transmission poses a severe risk to healthcare workers lacking proper PPE

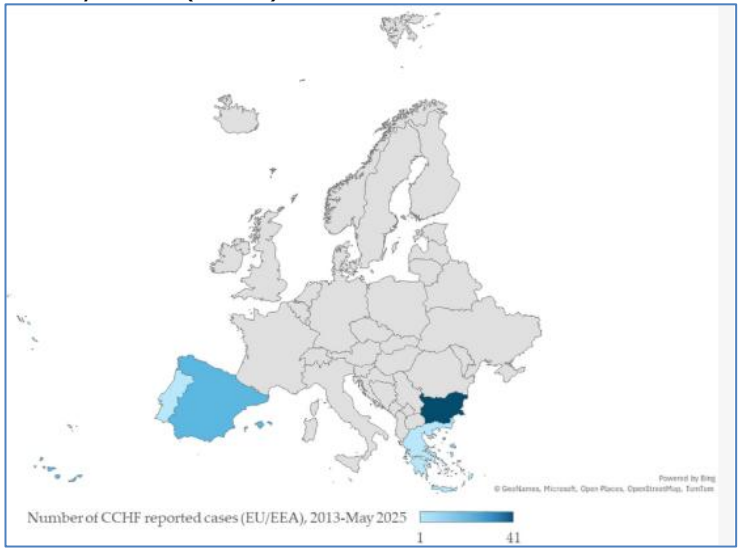
https://www.ecdc.europa.eu/en/crimean-congo-haemorrhagic-fever/facts/factsheet.

The Burden

- Global burden is estimated at 10,000 to 15,000 CCHF infections with 500 deaths per year
- cases have been reported in over 30 countries in Africa, Asia, and Europe,
- Within the borders of Europe, CCHFV is endemic in the Balkans
- EU/EEA: between 2013 and May 2025, **human cases associated with ticks of the *Hyalomma*** spp. have been detected in Bulgaria (n = 41 cases), Spain (n = 18 cases), Greece (n = 1 case), Portugal (n = 1 case), and in the United Kingdom (n = 1 case).



Distribution of CCHF cases in the EU/EEA, 2013–May 2025 (ECDC)



CCHF Risk Assessment

- risk estimates (combined CCHFV introduction and exposure)
  - low for the majority of the countries (Austria, Belgium, Germany, Luxembourg, Netherlands, Slovenia and Switzerland
  - medium for France and Italy, if accounting only for animal health consequences.

ELSEVIER

One Health

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Risk of Crimean Congo haemorrhagic fever virus (CCHFV) introduction and spread in CCHF-free countries in southern and Western Europe: A semi-quantitative risk assessment

Angela Fanelli, Domenico Buonavoglia

Table 2. Likelihood of occurrence of CCHF into EU free-countries.

Country	Likelihood of entry (Uncertainity)	Likelihood of exposure (Uncertainity)	Likelihood of occurrence
Austria	Medium (Medium)	Low (Low)	Low
Belgium	Low (Medium)	Low (Low)	Low
France	High (Medium)	Medium (Low)	Medium
Germany	Medium (Medium)	Medium (Low)	Medium
Italy	Medium (Medium)	High (Low)	Medium
Luxembourg	Low (Medium)	Low (Low)	Low
Netherlands	Medium (Medium)	Low (Low)	Low
Slovenia	Medium (Medium)	Low (Medium)	Low
Switzerland	Low (Medium)	Low (Low)	Low

Focus Italy- Epidemiological Evidence

- 2024: sera from 794 cattle collected across Basilicata region (Southern Italy) were screened using a commercial ELISA kit
- ~1.9% seroprevalence in transhumant herds
- No confirmed autochthonous human cases yet.

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Transboundary and Emerging Diseases

WILEY

SHORT COMMUNICATION

First serological evidence of Crimean–Congo haemorrhagic fever virus in transhumant bovines in Italy

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Abstract

Crimean–Congo haemorrhagic fever (CCHF) is an emerging tick-borne disease caused by the arbovirus Crimean–Congo haemorrhagic fever virus (CCHFV; family Nairoviridae). Given the public health impact, CCHF is considered a priority disease for the European Union. This study describes the first detection of anti-CCHFV antibodies in transhumant bovines in Italy. Sera from 794 cattle collected across Basilicata region (Southern Italy) were screened using a commercial ELISA kit. The animal-level and herd-level seroprevalences detected were 1.89% [95%CI: 1.12–3.1] and 29.63% [95%CI: 15.68–48.65], respectively. Results of the χ^2 test for trend show that the exposure to CCHFV was significantly associated with increasing age, with the odds 5 times higher in 11–22-year old cattle than 1–4-year old cattle. The detection of antibodies against CCHFV in indigenous cattle indicates that the infection occurred in the study area and may warrant further consideration. Additionally, no significant spatial clustering of CCHF infection was detected, supporting the hypothesis that the disease is widespread in the region. Further studies at larger scale are needed to identify the areas at higher risk of zoonotic infection. A One Health approach should be implemented to better understand the disease risk and dynamics in the country, which effectively address the related public health threat.

KEYWORDS
CCHFV, Crimean-Congo haemorrhagic fever, Italy, Tick-borne diseases

Focus Italy- Epidemiological Evidence

- Apulia (Gargano): 670 Podolic cattle from 59 farms in the province of Foggia were screened for CCHFV antibodies.
- Up to ~15% positivity
- All tick samples collected from the animals and in the study areas tested negative for CCHFV
- Positive sera awaiting confirmation in SN

CESME Activities

- 2016-2024
  - Risk of introduction and spread in Italy, through migratory birds, of the CCHFV and other zoonotic agents transmitted by vectors
  - Risk of introduction of non-native ticks carried by migratory birds.

National projects (MSRCTE0419 0724 RC)

- Serological and molecular monitoring of CCHF in Italy from a One Health perspective- NewHera (New haemorrhagic fever surveillance research approach)
  - Objective 1: Study of seroprevalence of CCHFV in cattle and equine populations selected by each U.O. (IIZZSS).
  - Objective 2: Identification of morphology and research into CCHFV in ticks sampled from cattle, equidae and the environment, to be carried out, where possible, in the same areas involved in serological monitoring by each U.O. (IIZZSS)
  - Objective 3: Study of seroprevalence of CCHFV in humans.

Azienda Sanitaria Friuli Occidentale (AS FO)

EU Financed Projects

- Direct Grant CP-g-22-04.01 for MSs: Setting up a coordinated surveillance system under the One Health approach for cross-border pathogens that threaten the Union
  - Goals: strengthen a system for monitoring emerging and re-emerging pathogens in animals and the environment in MSs and neighbouring countries
  - Integration between the new system and existing systems
  - Specific goal: carry out national assessments in a One Health approach to identify national risks and priorities for the future

CCHF Risk Assessment

- EFSA: received a mandate from the G2-Animal Health Unit of the EC for three scientific opinions:
  - potential transmission routes of VBD
  - surveillance, prevention, and control measures, and mapping of vectors
  - assess the role of climate change and the potential evolution of virulence or transmissibility.
- One Health approach, collaboration with the ECDC was also deemed relevant
- VectorNet project: joint risk assessment (Blue tongue, WNV, CCHF).

Conclusions

- Global warming significantly impacts the prevalence and the distribution of virus-infected ticks, heightening the risk of transmission to human and animals.
- Understanding these dynamics is essential for understanding the ecology and geography of CCHF to develop effective surveillance, prevention and control strategies.
- One Health strategy
- increase the sensitivity of detection, promote early warning capabilities, and improve preparedness for the possible emergence of CCHFV in new areas.

Perspectives

- Veterinary strategies must be sharply focused on primary prevention, early detection (migratory birds, ticks and reservoir animals)

- Strengthening collaboration between European countries is essential because current efforts are often isolated and heterogeneous in methodology

- Citizen science initiatives may serve as an effective complementary tool, facilitating early detection of *Hyalomma spp*. and engaging the public in surveillance efforts.