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Surveillance and Control of Bluetongue

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Surveillance of vector born diseases

- ✅ 1. **Dependency on vector distribution and abundance**
  Surveillance must consider the presence, seasonality, and density of vectors (e.g., insects) that transmit the disease, as these factors directly affect the risk of infection.
- ✅ 2. **Environmental and climatic influence**
  The effectiveness of surveillance systems is heavily influenced by environmental and climatic conditions (temperature, rainfall, humidity), which can alter vector activity and pathogen persistence.
- ✅ 3. **Need for integrated entomological and epidemiological monitoring**
  Surveillance requires combining animal health data (clinical signs, serology) with entomological data (vector trapping and identification) to detect circulation early and implement timely control measures

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Surveillance of Bluetongue

- The programs of the bluetongue surveillance must consider of at least **passive clinical surveillance** and **active surveillance** based on laboratory tests.

- **Entomological surveillance** is needed to:
  - Identify the main vector species
  - Assess the seasonality of vectors

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Main objectives of Bluetongue surveillance

1. **early detection** of BTV serotypes not reported in the previous two years (to be reinforced adjacent to infected areas)
2. **determining the extent of BTV** infection , monitoring prevalence and ensuring that the spread of infection is delimited in a timely manner
3. **demonstrating the absence** of BTV infection

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Reg 689/2020 Part II Chapter I Section I

Detection of serotype nont reported in the past two years

- The surveillance must:
  - have the capacity at least to **detect**, with a 95 % level of confidence, the infection in the targeted animal population at a **target prevalence rate of 5 %**
  - address:
    - the **risk of infection with limited clinical manifestations**;
    - the **risk of introduction** of any of the serotypes 1-24 of BTV in the vicinity;
    - any **other identified relevant risk factor** for introduction.

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Determine the extent of infection

- The design of the surveillance must take into account **all available information** on the epidemiology of the disease and biology of the vector that prevail on the territory.
- The **target prevalence** rate of the surveillance must be **adapted to the epidemiological situation**, taking into the main risk factors such as the targeted animal population and the vector population

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Demonstrate the absence of infection

- The design of the surveillance must address:
  - (a) the risk of infection with limited clinical manifestations;
  - (b) all available information on the epidemiology of the disease and biology of the vector that prevail on the territory; and
  - (c) any **specific risk of persistence** of the infection
- The surveillance must have the capacity at least to detect, with a 95 % level of confidence, the infection in the targeted animal population at a **target prevalence rate of 1 %.**

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Surveillance

- The geographical units must be based on a **grid of 45 km by 45 km** and can be adapted
- **Active surveillance** must be based on one or a combination of
  - monitoring of **sentinel animals** using serological or virological testing
  - structured prevalence surveys, based on a **random or risk-based sampling strategy** using serological or virological testing
- **Target animals**

Serological surveillance system in Italy

- Since 2002 up to 2014, a robust and organized network of **sentinel animals** has been established in Italy to monitor BT virus (BTV) circulation. The Italian territory has been divided in 20 x 20 km square grids. In each square, around 58 animals are selected and used as sentinel animals.
- The surveillance system includes more than 30,000 animals.

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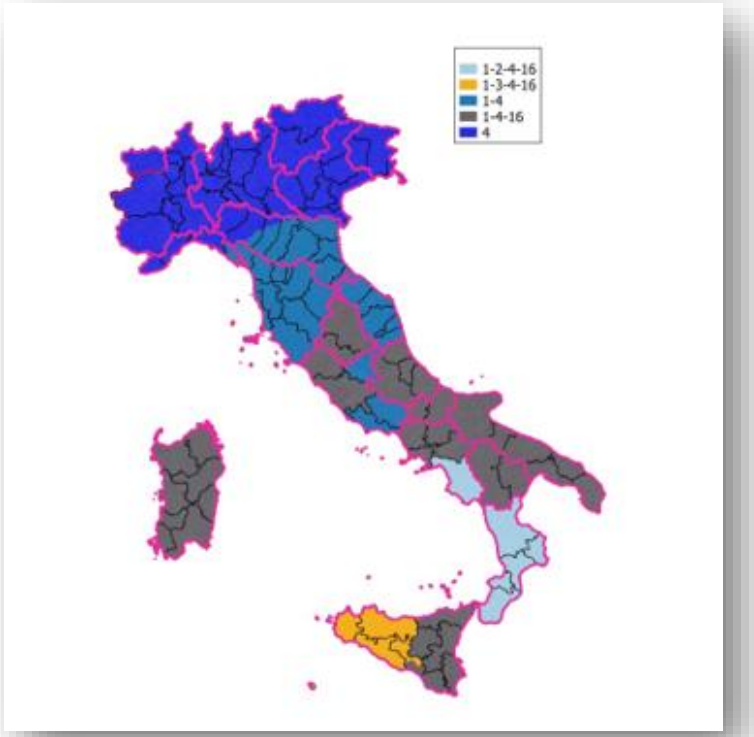
Bluetongue: serological surveillance system in Italy

2015



2018

From surveillance to control

The pillars for BT control are:

- *Surveillance*
- **Control of movements**
- Vaccination

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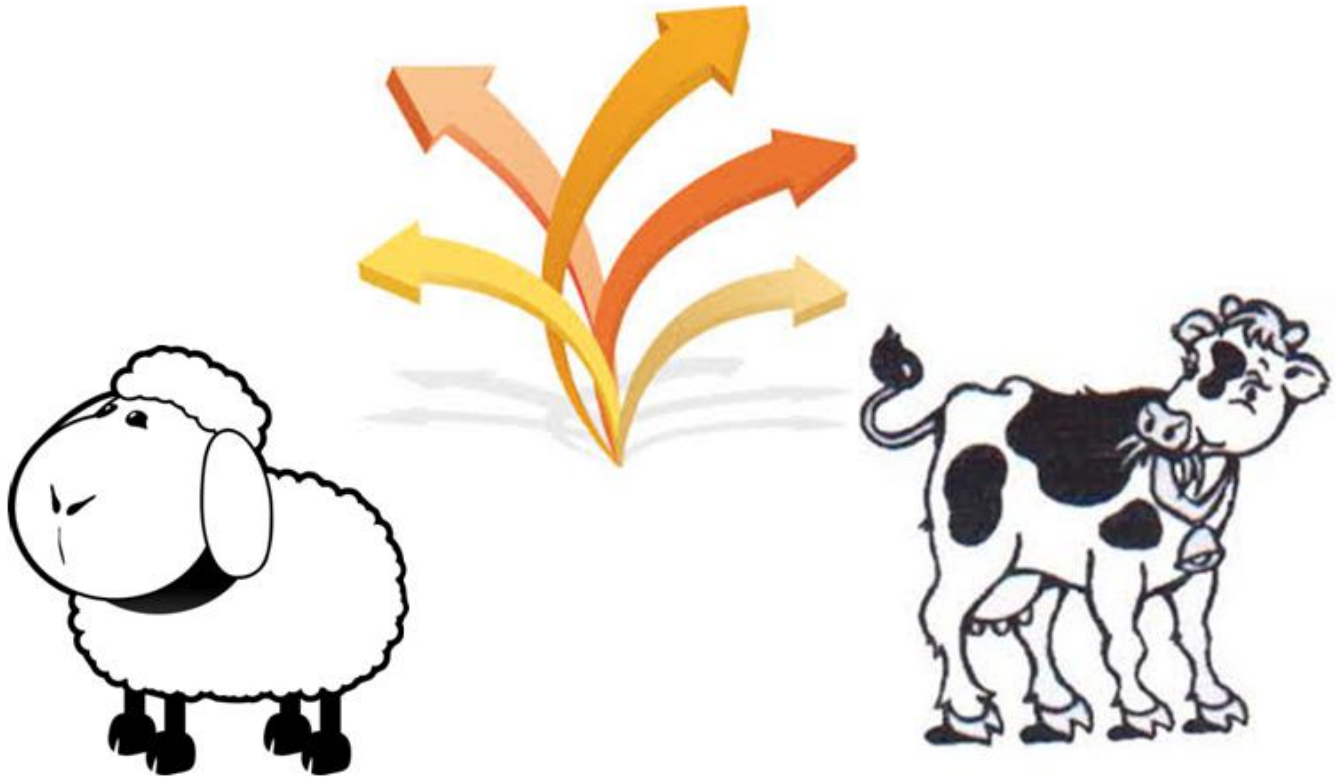
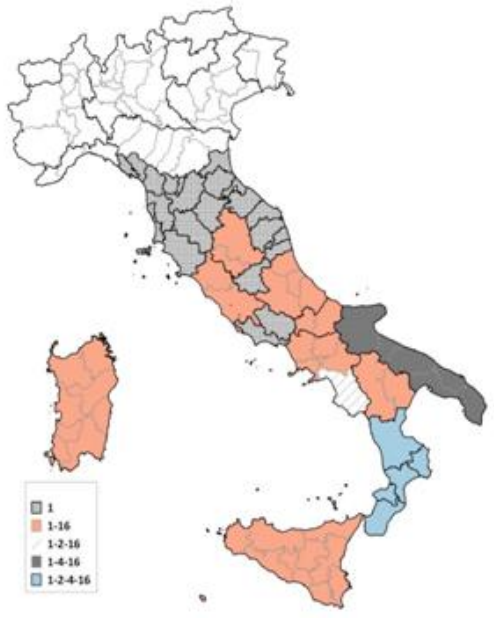
Movement restriction



to prevent the introduction of infected and viremic animals in free zones or in countries with an approved eradication plan

Movement restriction in Italy

- In Italy, for a long time, the **system of sentinel animals** tested on a monthly basis provided an up-to-date picture of the circulation of the virus in the country, enabling a more detailed "**zoning**" strategy and **greater flexibility** in moving animals.
- The current surveillance system, based **on four-monthly sampling** has a reduced sensitivity in this respect.
- **Today**, movements within the national territory are facilitated by the fact that the entire country is **uniformly affected** by the presence of different serotypes (with the exception of Bolzano and Friuli Venezia Giulia).



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In case of BT case confirmation

Preliminary measures may include farm surveillance, restriction of movements, tracing activities, and monitoring

Additional measures proportionate to the risk posed by the disease that take into account:

a) the profile of the disease;

b) the animals kept affected;

c) the economic and social repercussions

The competent authority evaluates the measures to be taken

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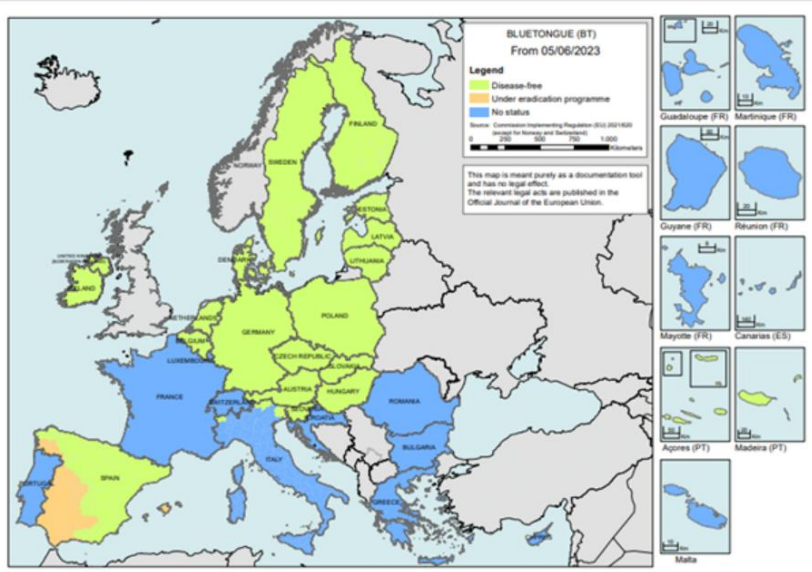
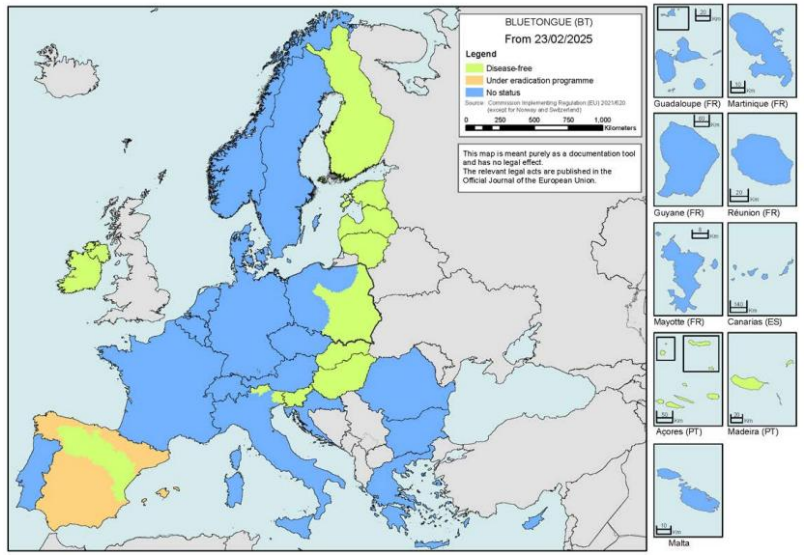
Movement control within the EU

Movements between European countries are subject to strict conditions especially to **protect territories that are officially disease-free or have approved eradication programmes.**



2023



2025

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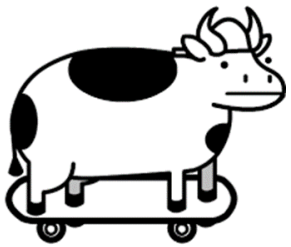
Movement control within the EU

- Delegated Regulation (EU) 2020/688 provides the **rules for the movement of animals within the EU**
- **Possible Derogation** under which the Member State of destination accepts animals under certain sanitary conditions to make these derogations operational, the Member State of destination must inform the Commission and other Member States



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Reg 688/2020

Movement control within the EU

- Vaccination, or
- Vector protected establishment
- Seasonally BTV-free Member State or zone

for 60 days or

  - 28 dayes + serology
  - 14 days + PCR
- Animal testing

From surveillance to control

The pillars for BT control are:

- *Surveillance*
- Control of movements
- **Vaccination**

A BT risk analysis indicated that the **vaccination** of **all susceptible species** was the sole strategy able to **reduce direct and indirect economic losses**.

TO BE TRULY COST-EFFECTIVE IT MUST BE APPLIED PREVENTIVELY, NOT AFTER THE DISEASE HAS SPREAD

Vaccination: Evolution of EU legislation

Directive 92/119/EEC in force until 2000

- Stamping out
- Vaccination not considerd

Council Directive 2000/75/EC of 20 November 2000

- Vaccination was considered a complementary measure to stamping-out, to control direct losses and to limit the spread of infection

After 2000

- In Italy for the first time, mass-vaccination of cattle was applied

Vaccination

Goals of vaccination:

- protection of animals from the clinical form??
- reducing the spread of infection or the viral circulation??

The answer to these questions will change from country to country, particularly in relation to the structure of the market and to the need of moving animals

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Conclusion

Due to its geographical position, **Europe is and will always be exposed** to new virus incursions from the south and east.

This:

- Complicates control strategies based on **vaccination**
- Reinforces the importance of comprehensive epidemiological **surveillance**
- Suggests a **supranational approach**, establishing surveillance networks among countries

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Special thanks to

Virologists

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