



# Better Training for Safer Food *Initiative*

## Introduction to African swine fever

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# BTSEF

**Belgrade, Serbia 27/02-01/03/2018**

# African Swine Fever Virus

“Highly” contagious viral disease of swine

Asfarviridae

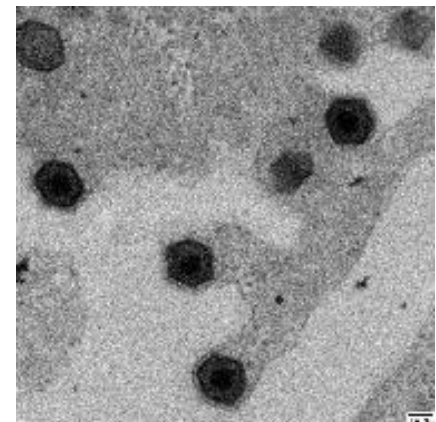
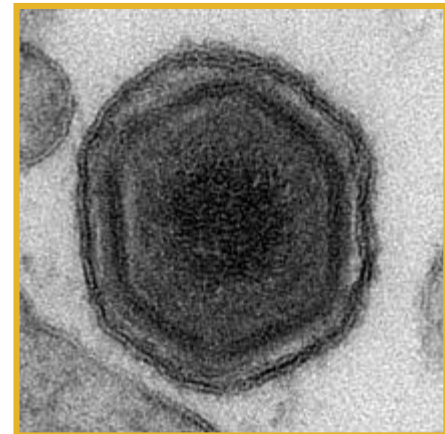
Enveloped DNA virus;

Transmitted by arthropods;

Isolates vary in virulence:

High virulence: up to 100% mortality;

Low virulence: seroconversion.



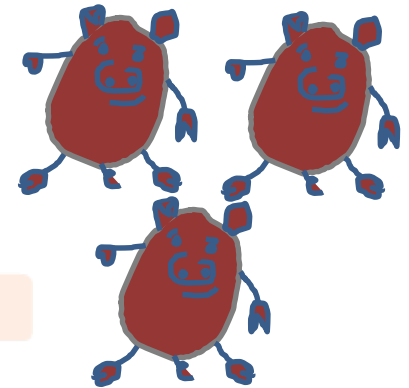
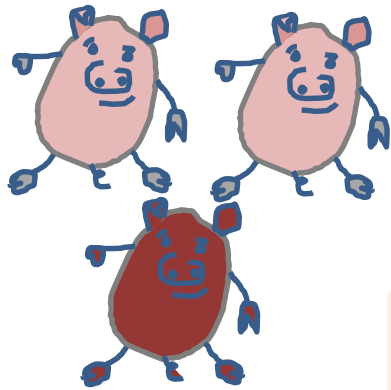
## ASF is defined as:

“a highly contagious hemorrhagic disease of suids...”

Reality:

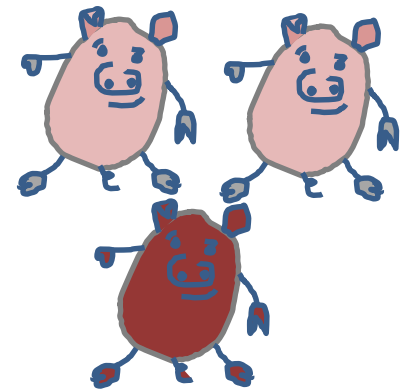
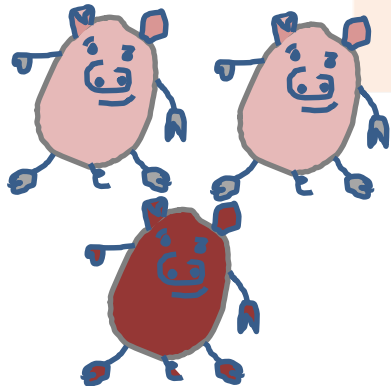
-> ASF is **not** a very highly contagious disease

Defining ASF as “*highly contagious*” leads to false expectations and underestimation of the problem...



**Expectation**

BTSEF



**+3d**

# African Swine Fever Virus

- *Highly resistant;*
- *Killed by high temps and some disinfectants;*
- *Affects domestic and wild pigs.*



## European susceptible species:

- Domestic pigs and European wild boar
- All age categories (no age dependency)
- Without gender predilection

*(African wild swine – warthog - are unapparent infected and act as reservoir hosts for ASFV in Africa)*

*It is not a zoonosis*

# Environmental Persistence

## ***Stable at pH 4-13...***

*Survives at least:*

- *11 days in feces (room temp)*
- *1 month in soiled pig pens*
- *70 days in blood on wooden boards*
- *15 weeks in putrefied blood*
- *18 months in blood at 4°C*



## ASF VIRUS IS VERY STABLE

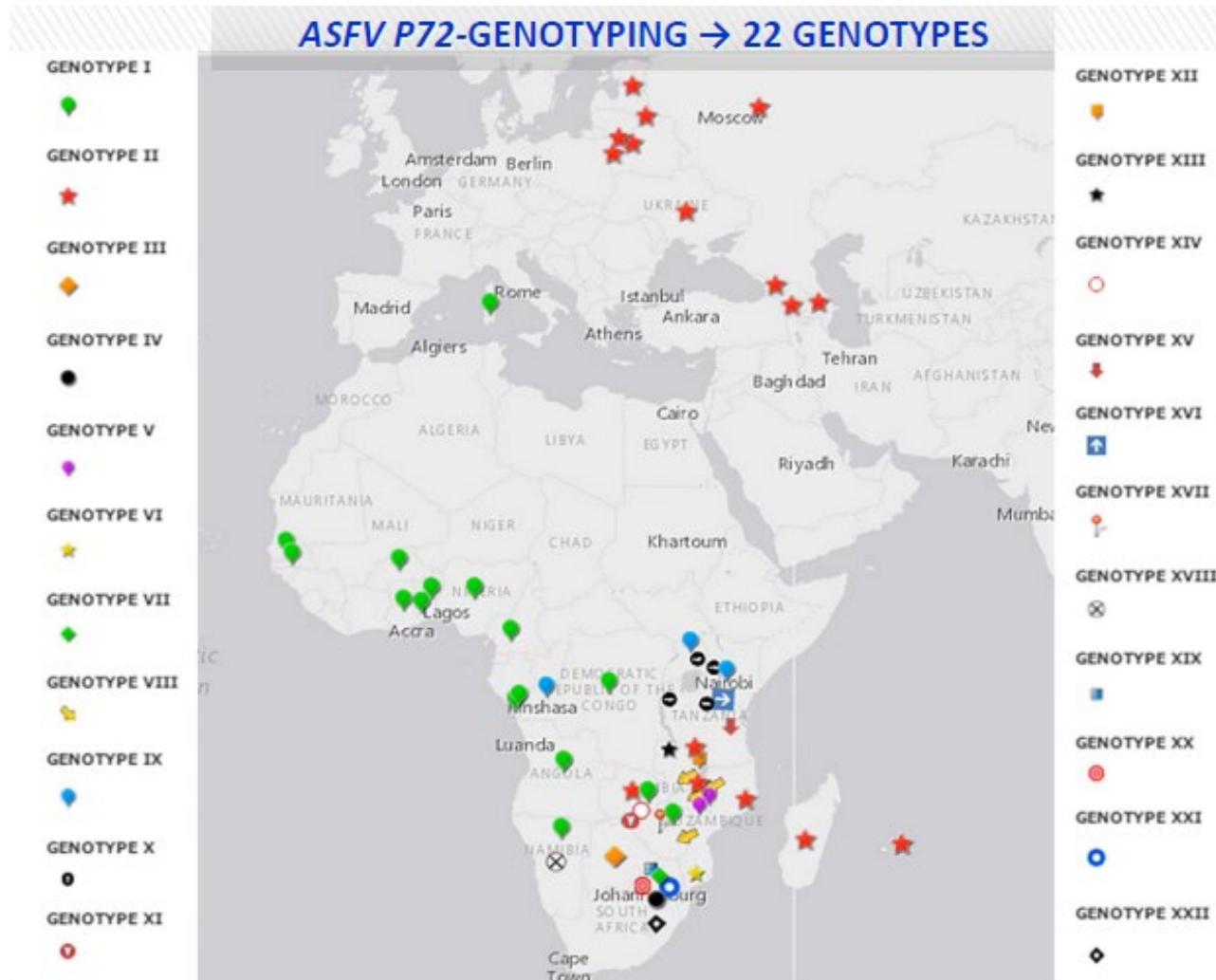
**Carcasses: 3 – 5 weeks infectious**

- 140 days in Iberian and Serrano hams
- 399 days in Parma ham
- 112 days in Iberian pork loins.
- 18 months in pig blood at 4°C
- 11 days in faeces at 20°C
- **Stable in carcasses (dead animals) which decompose**

*However, no infectious ASFV has been found in cooked or canned hams when processed at 70°C.*



# ASF genotype circulation



# African Swine Fever

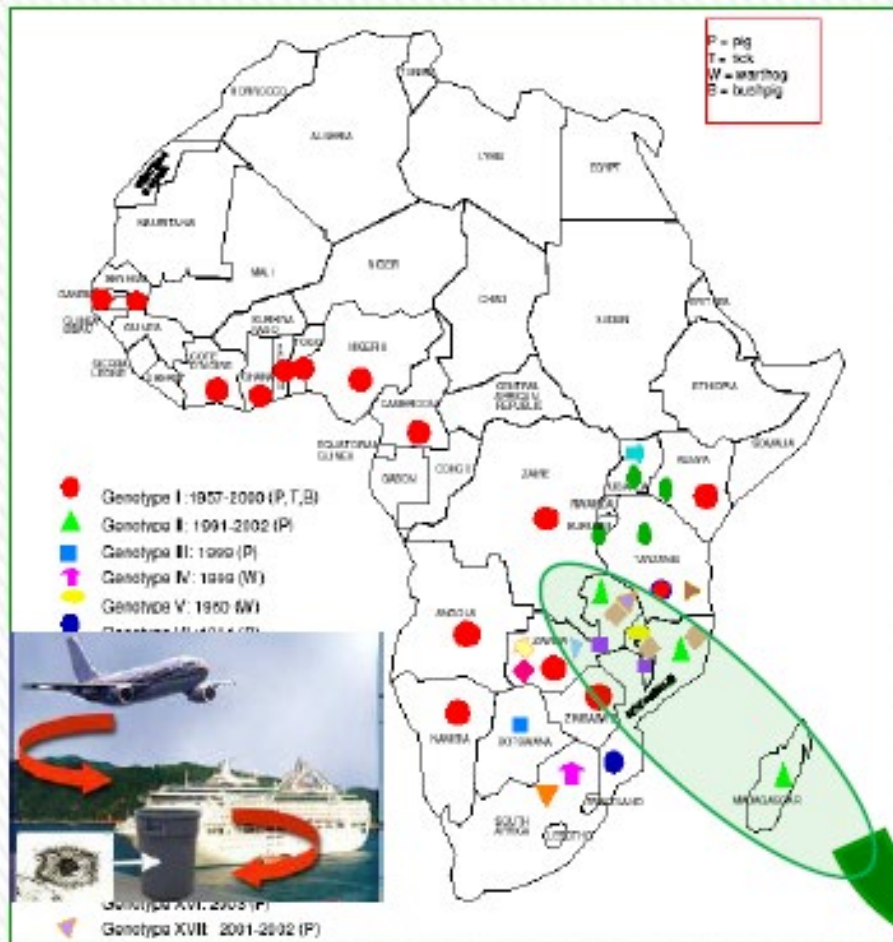
- First reported in 1921 in Kenya
- Acute to chronic disease
- characterized by high fever
- Cutaneous hyperemia
- Edema
- Hemorrhagic internal organs
- Abortions
- Can see bloody diarrhea



- Distribution – Sub-Saharan Africa
- Europe, Dominican Republic, Haiti, Cuba and Brazil
- Endemic in Africa and southern Europe



# Tracing the origin



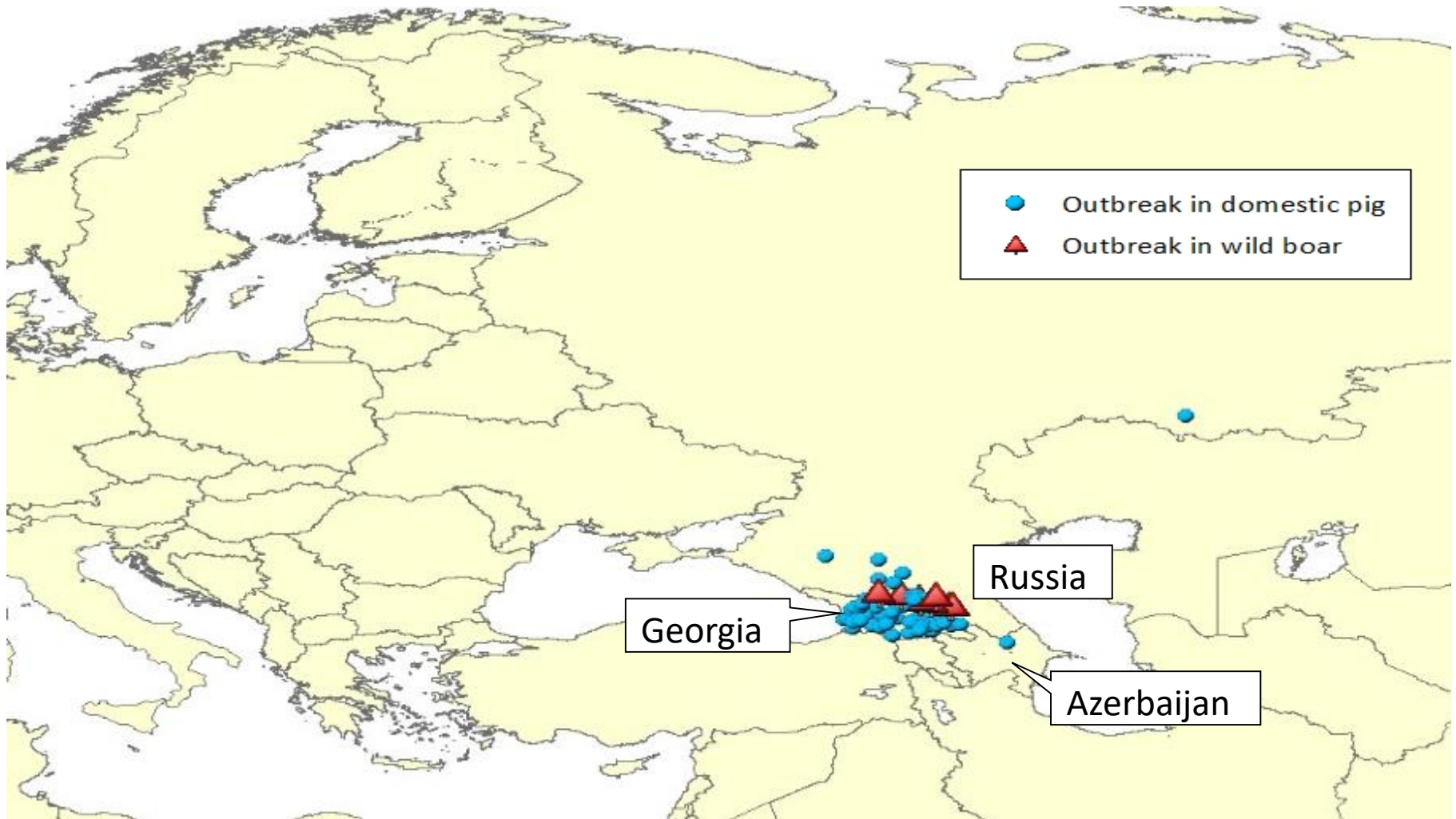
## Georgia June 2007



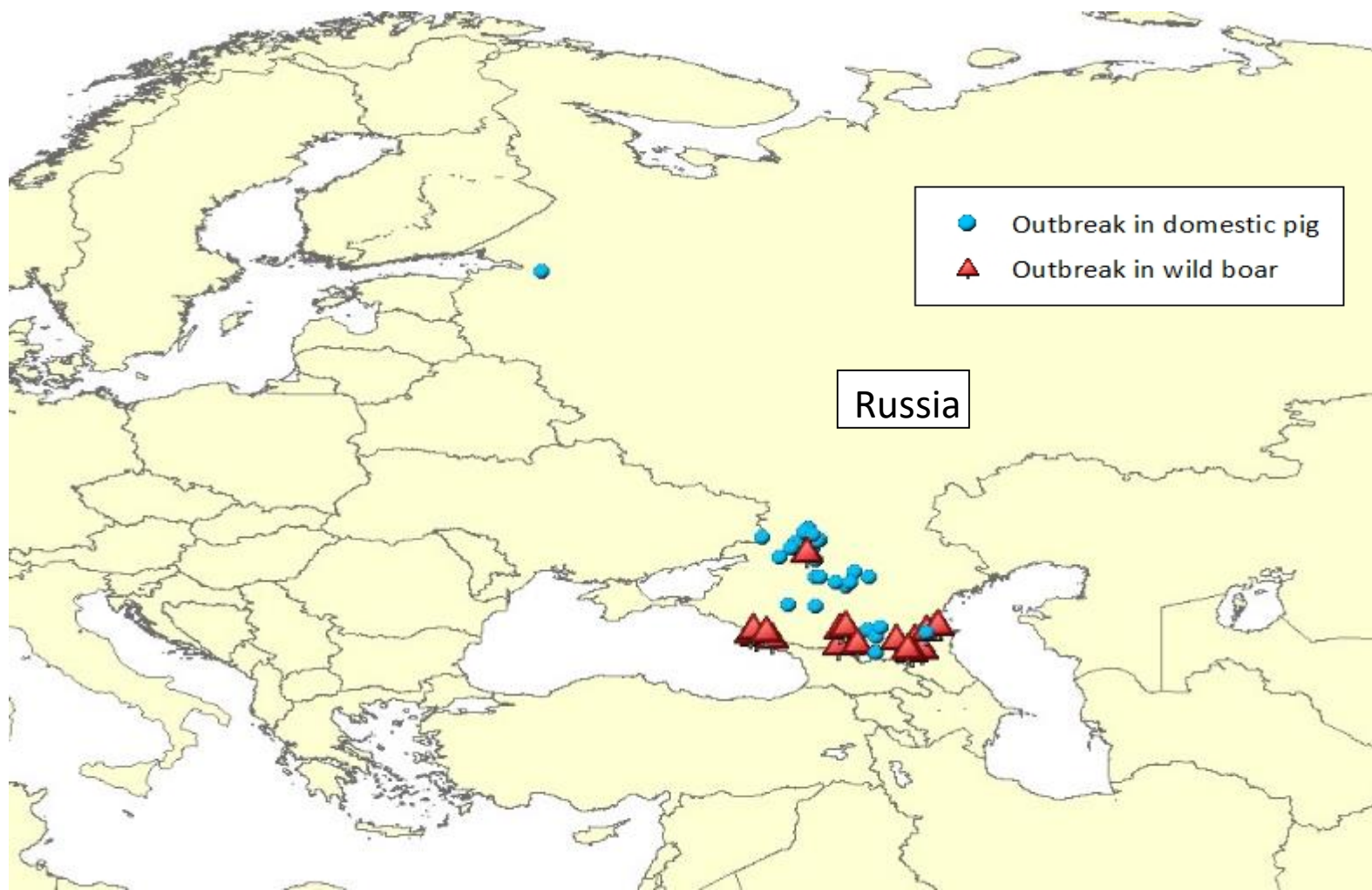
# Outbreaks reported in Eastern Europe (2007)



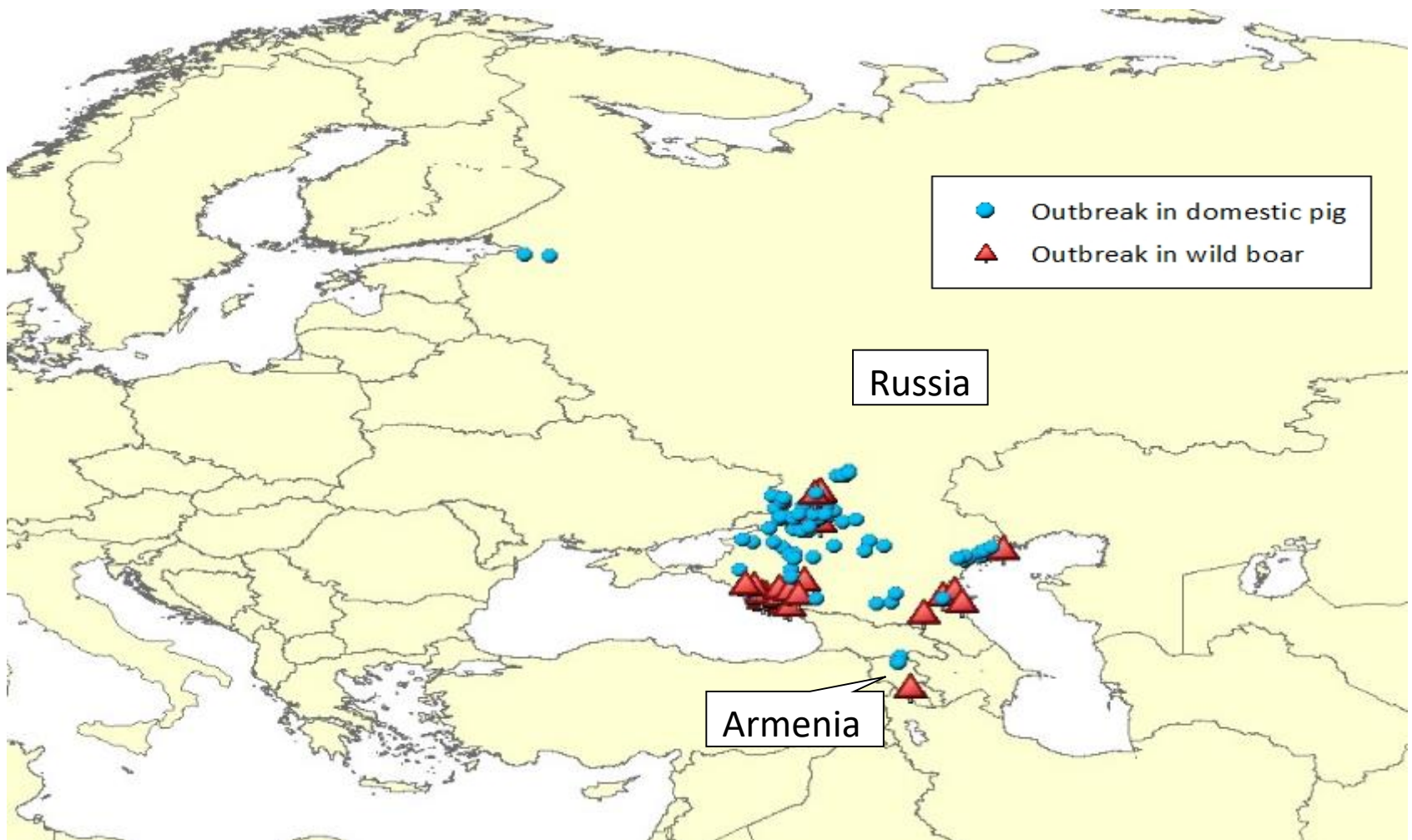
# Outbreaks reported in Eastern Europe (2008)



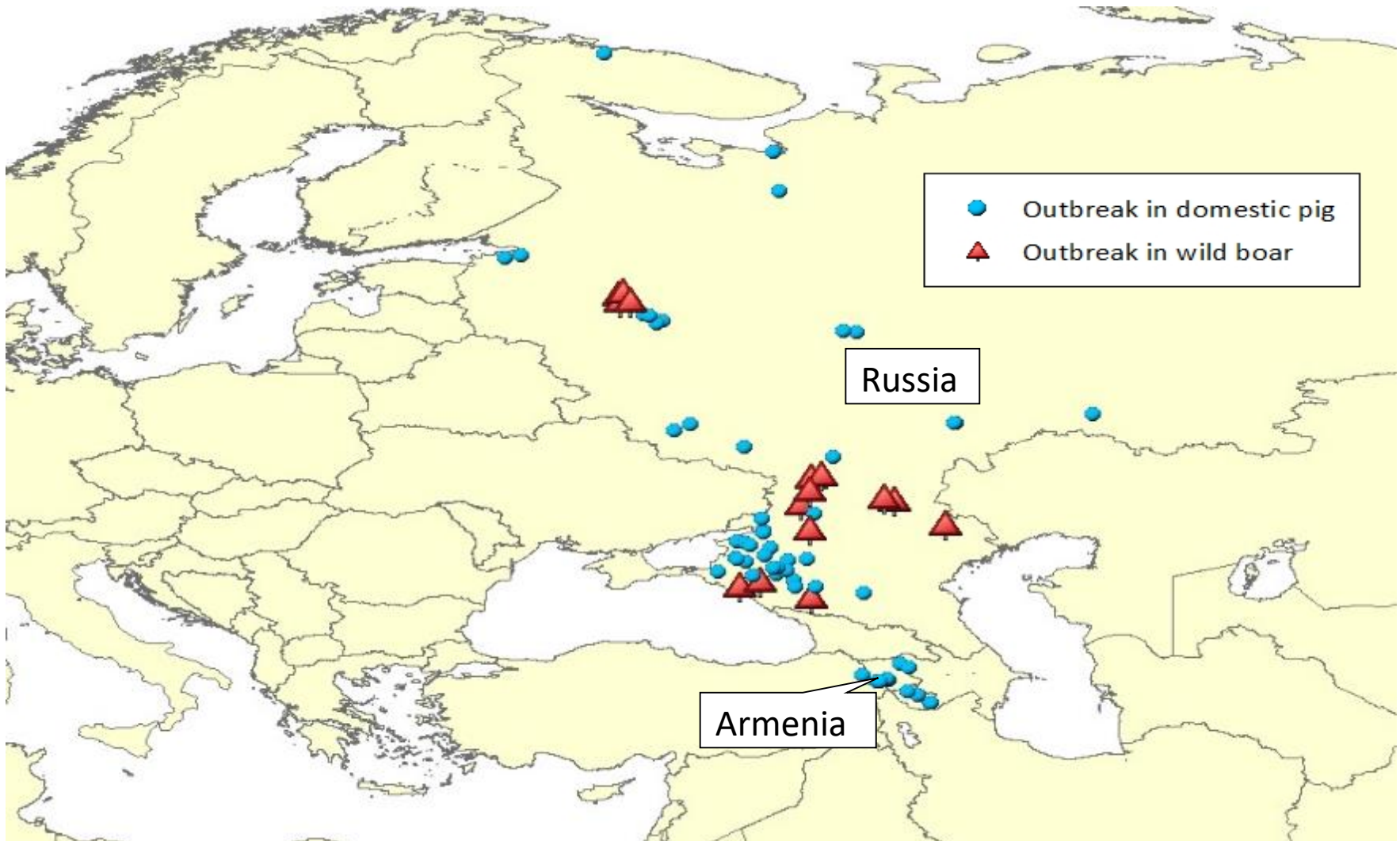
# Outbreaks reported in Eastern Europe (2009)



# Outbreaks reported in Eastern Europe (2010)

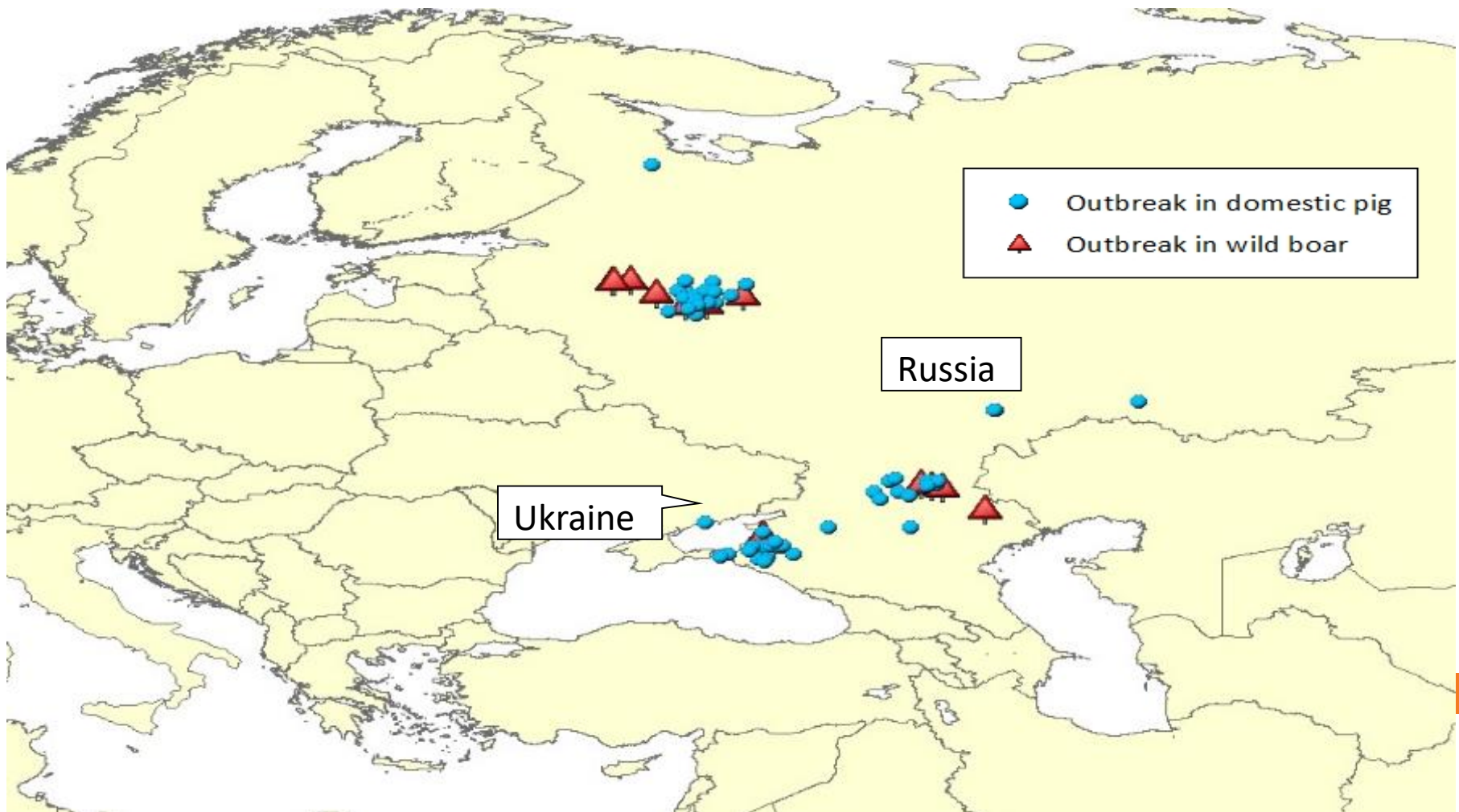


# Outbreaks reported in Eastern Europe (2011)

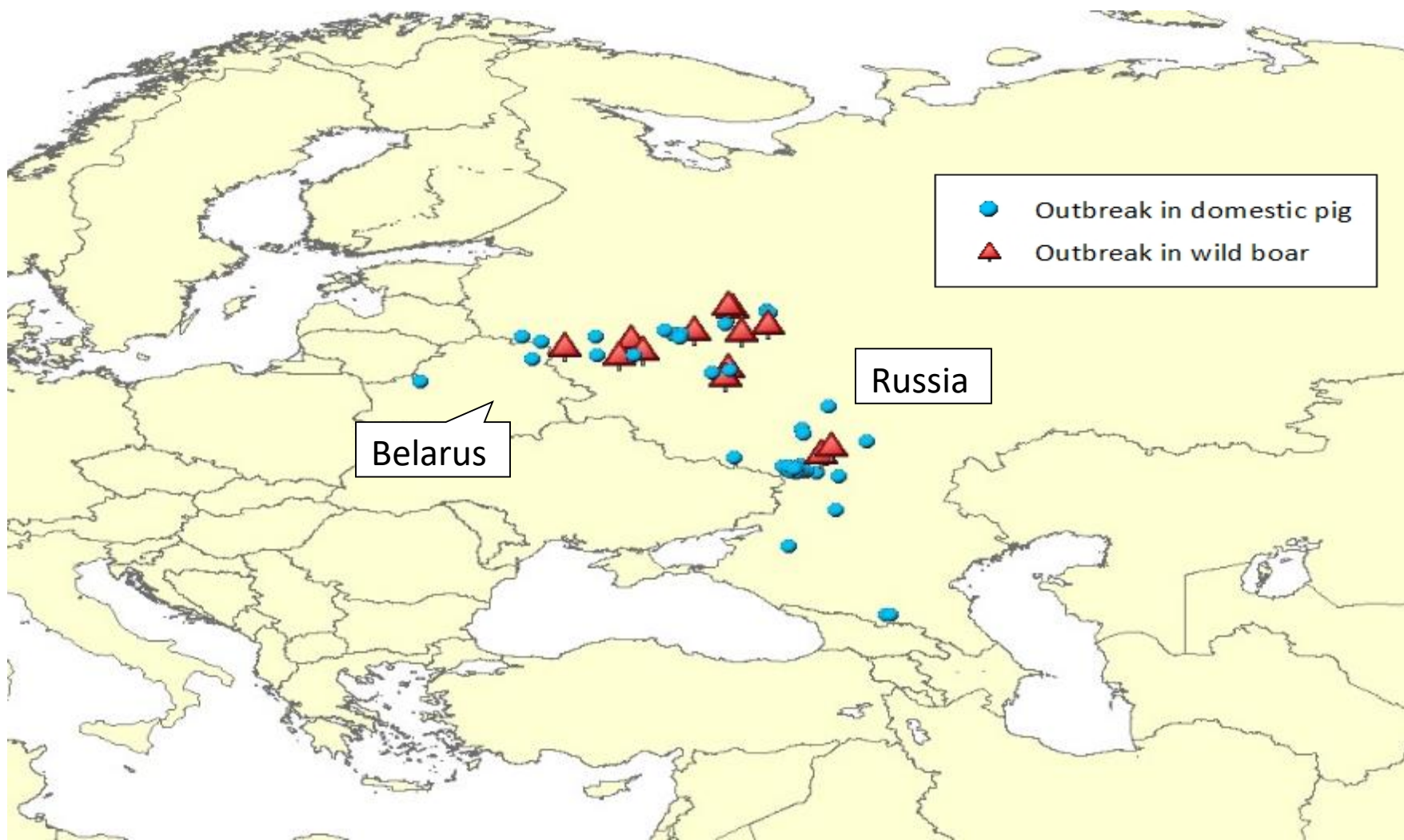




# Outbreaks reported in Eastern Europe (2012)



# Outbreaks reported in Eastern Europe (2013)



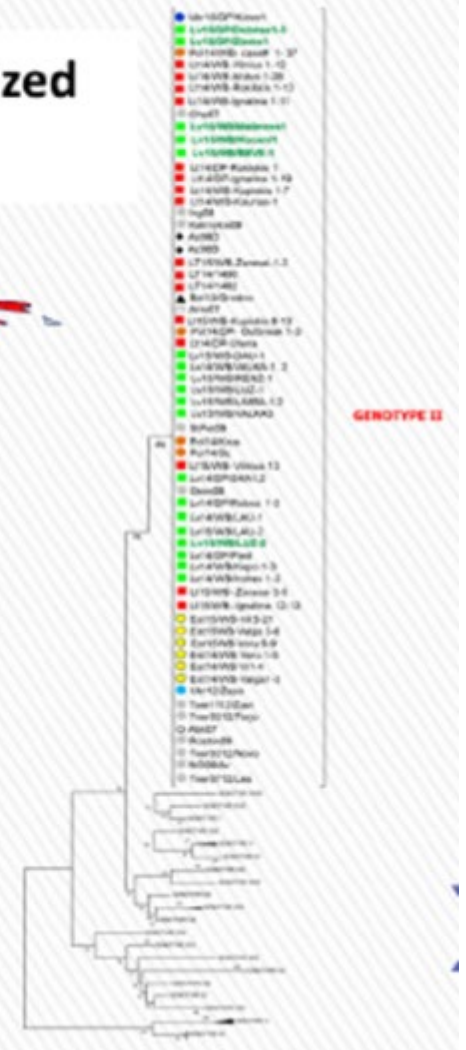


## From the GENETIC DATA

**All Eastern European ASFV isolates characterized clustered within p72 genotype II**

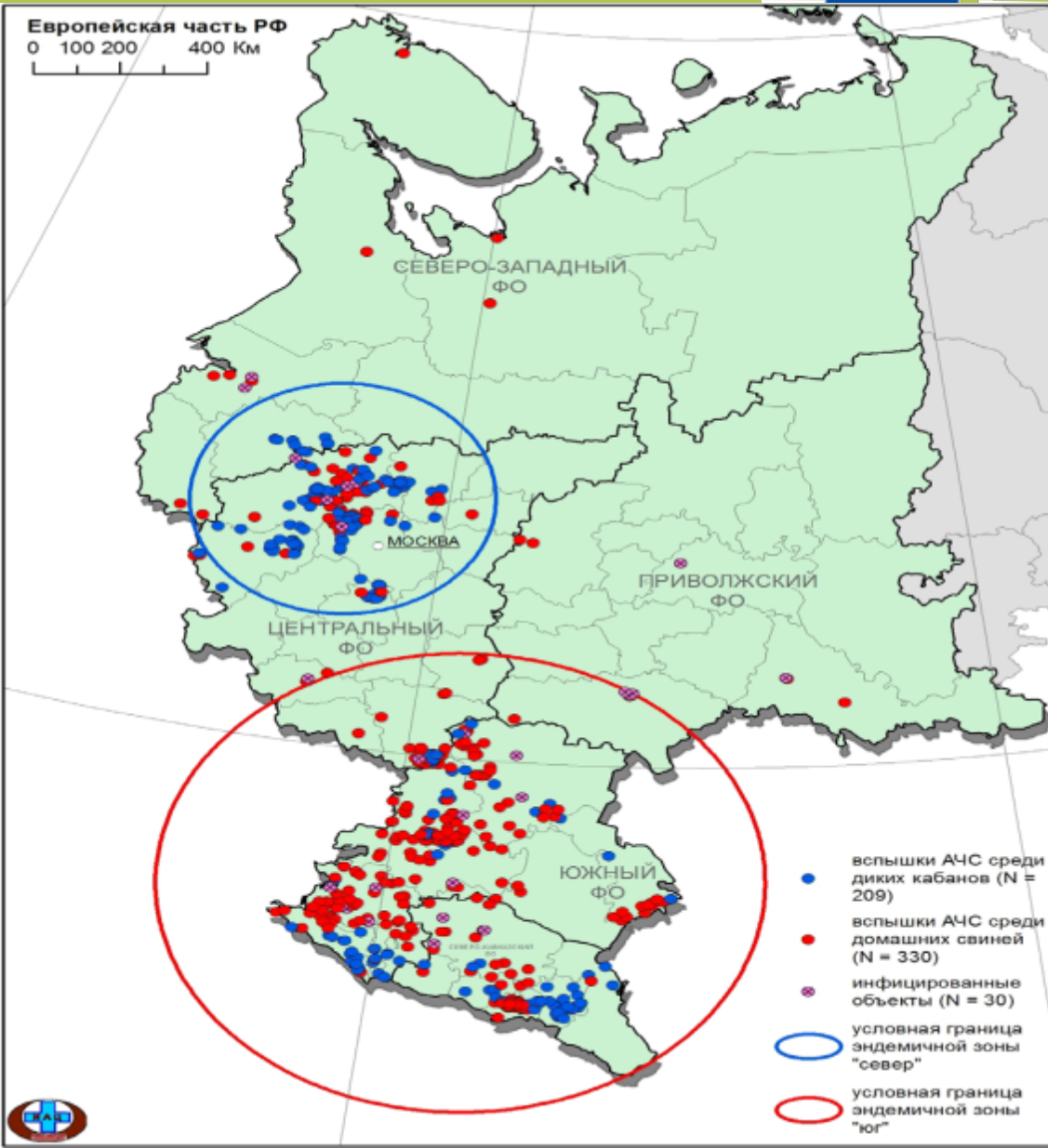
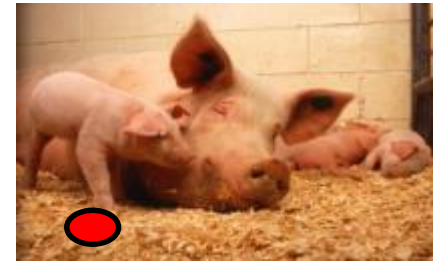


**Single introduction** → Since its introduction in 2007 in Georgia all ASFV isolates circulating in Eastern and Central Europe are classified within p72 genotype II.





# ASF spread





# 2007-2013

# ASF spread



- **6 affected countries in Eastern Europe** (Georgia, Azerbaijan, Armenia, Russian Federation, Ukraine, Belarus)
- **Ongoing spread of ASFV towards west affecting eastern European countries, such as Ukraine (2012) and Belarus (2013)**

## EASTERN EUROPE

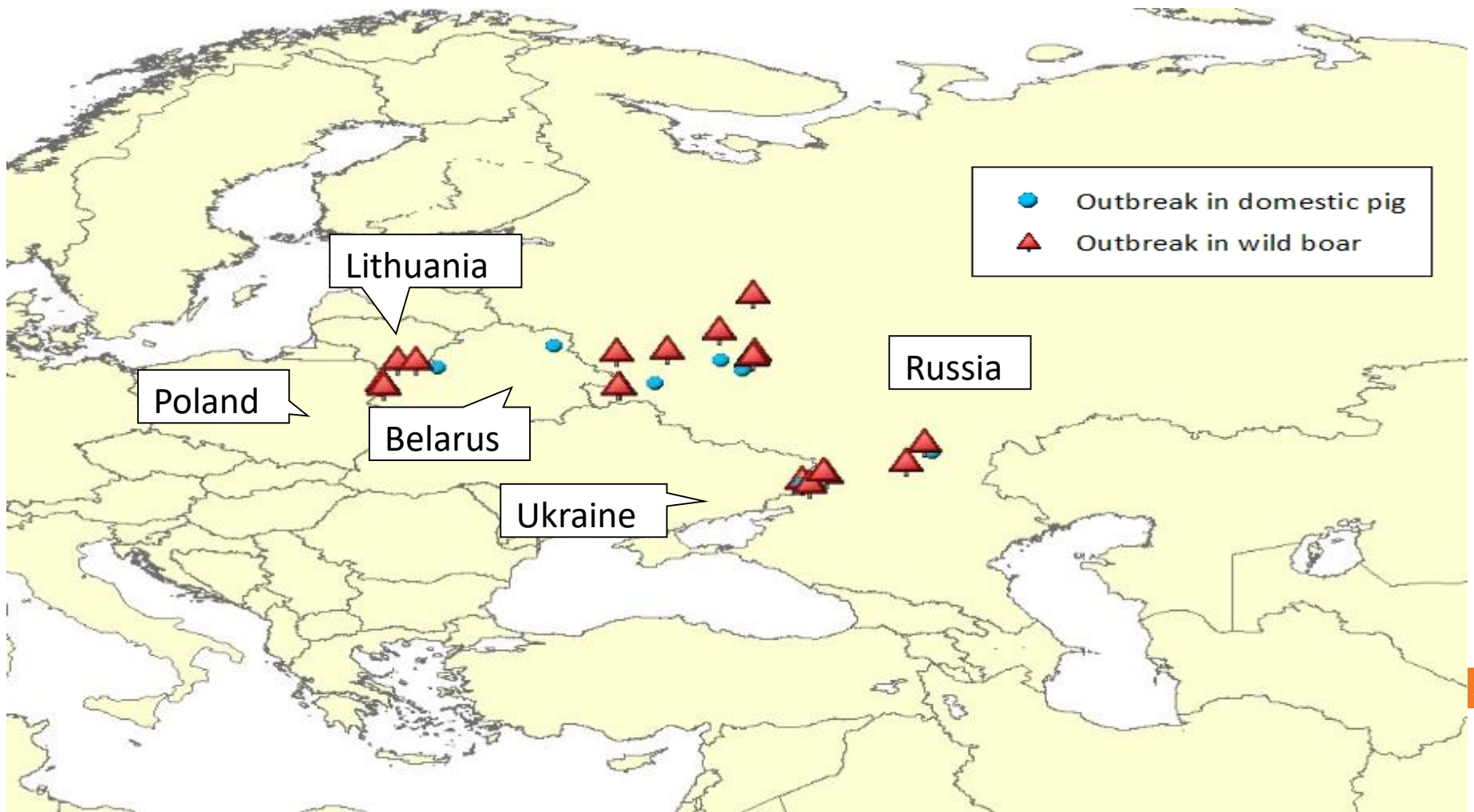
9 countries  
affected since 2007



## ITALY

ASF present since 1978

## Outbreaks reported in Eastern Europe (Jan-May 2014)



2014

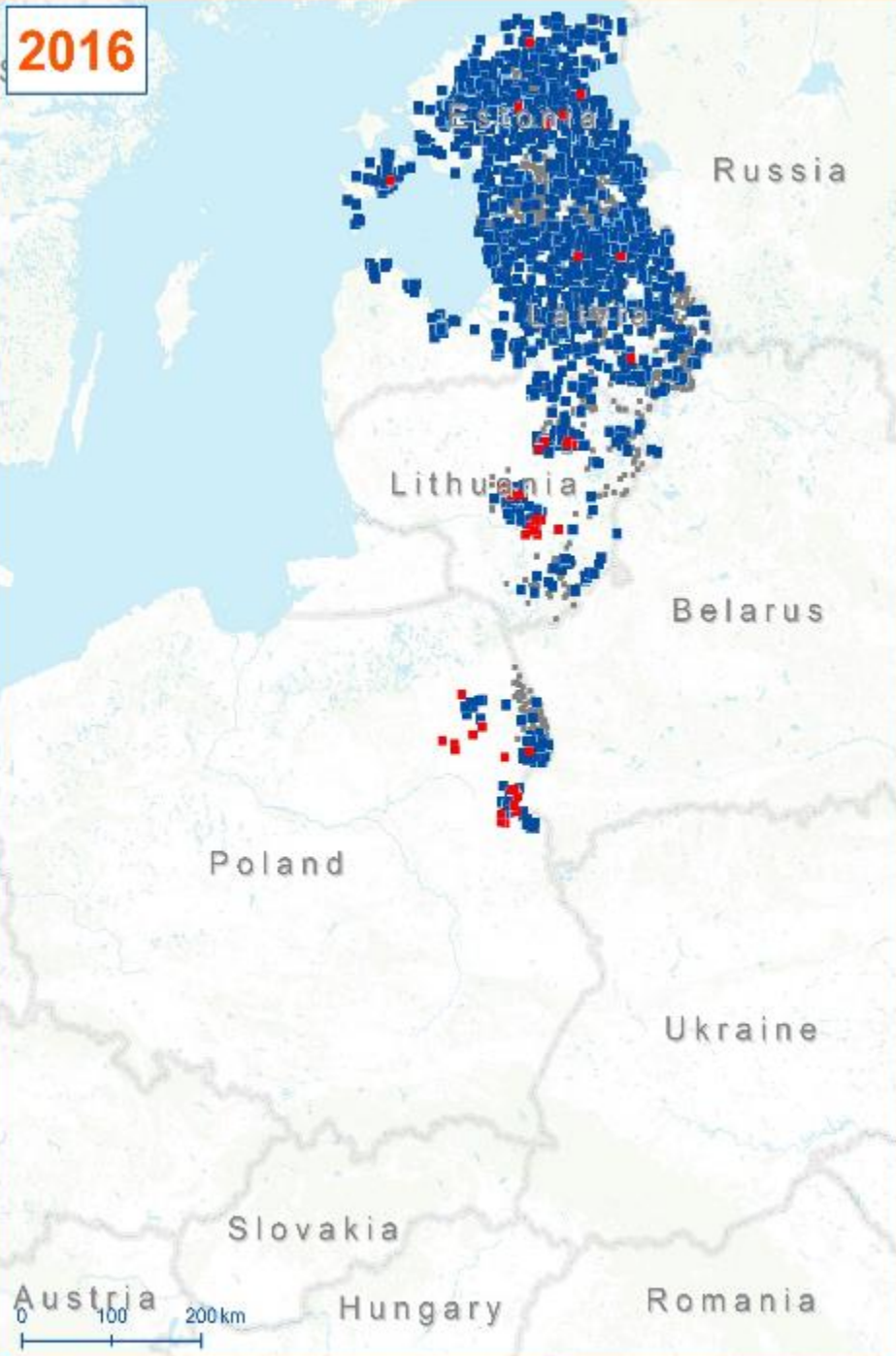


2015

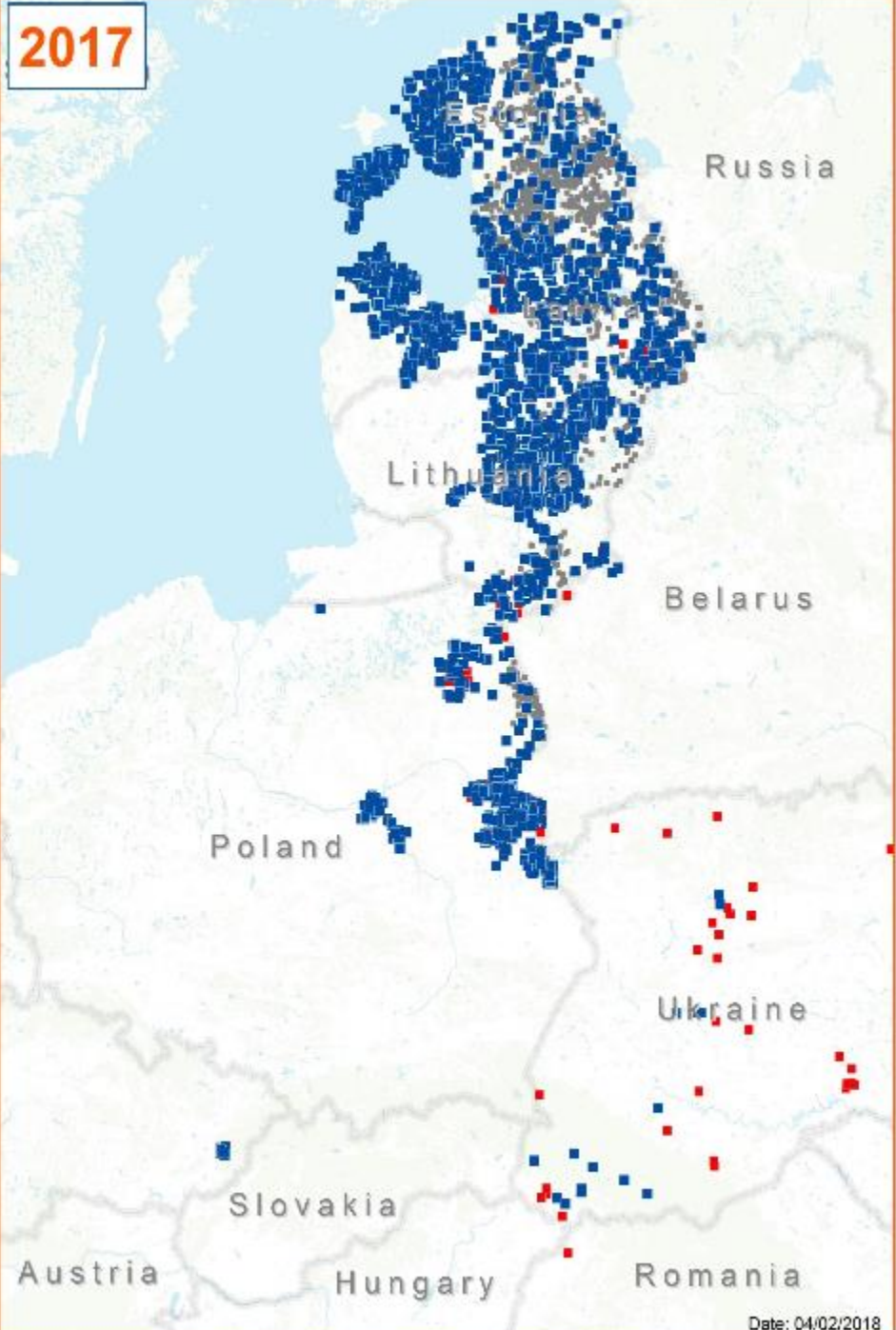




2016

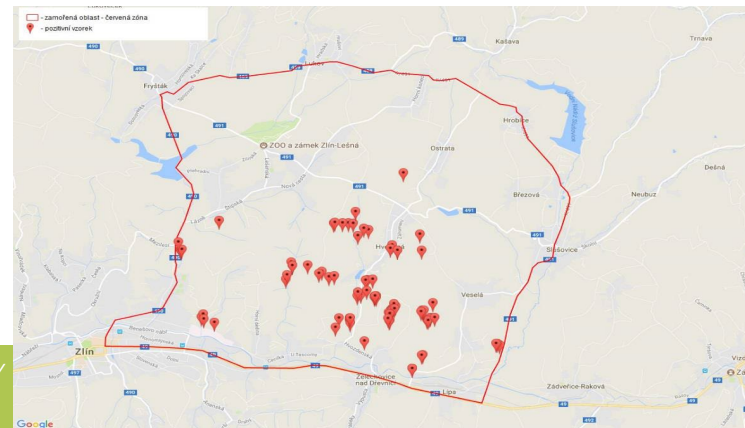
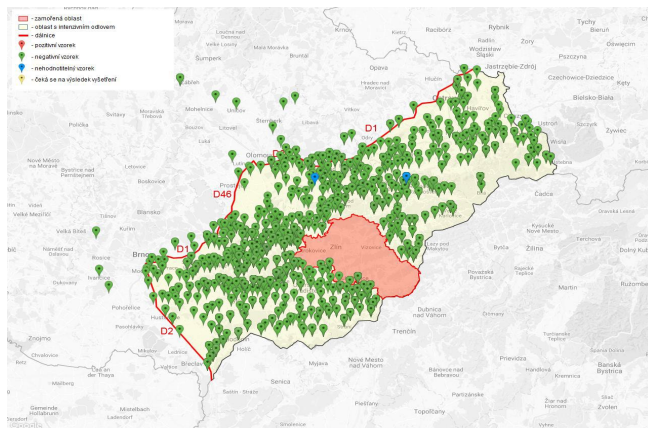
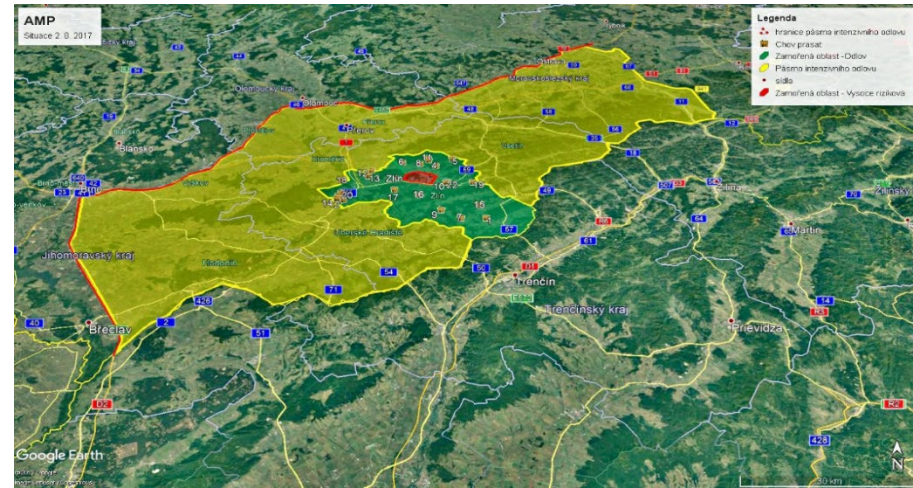
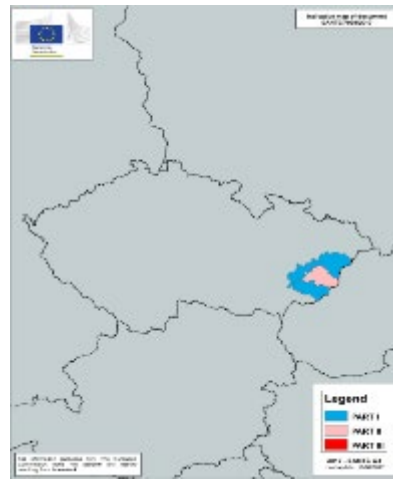
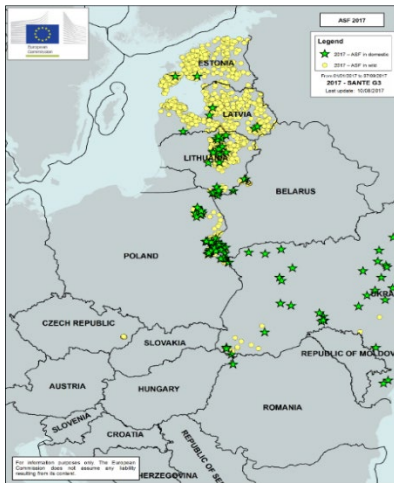


2017

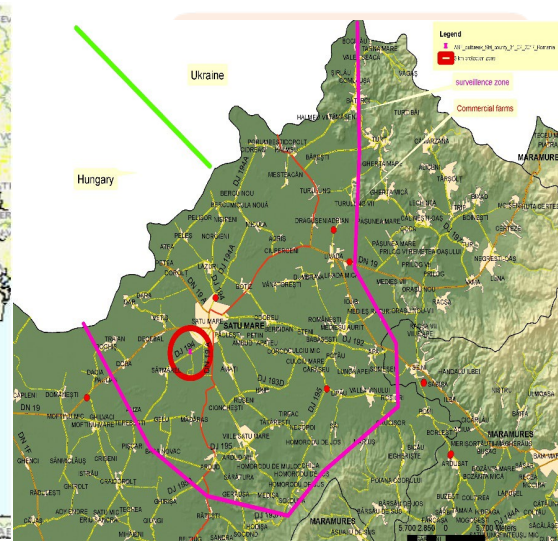


Date: 04/02/2018

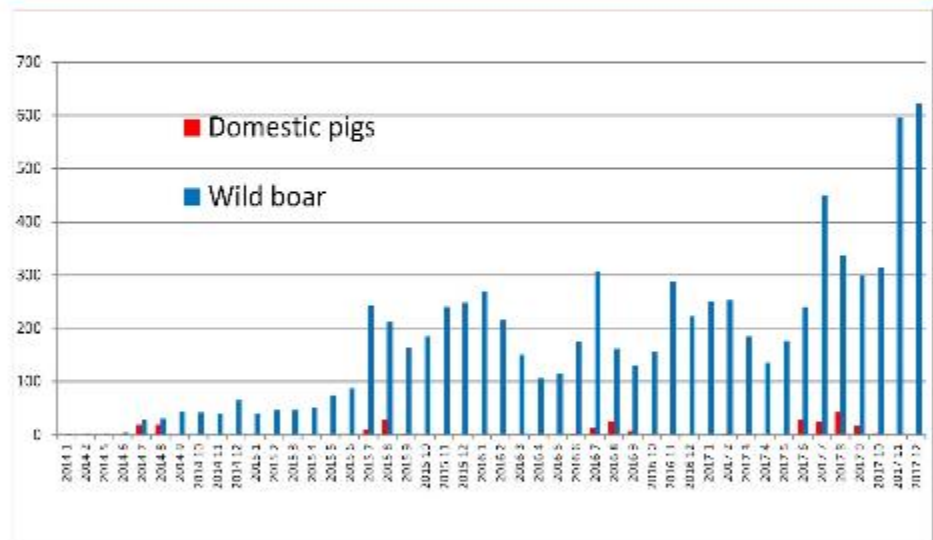
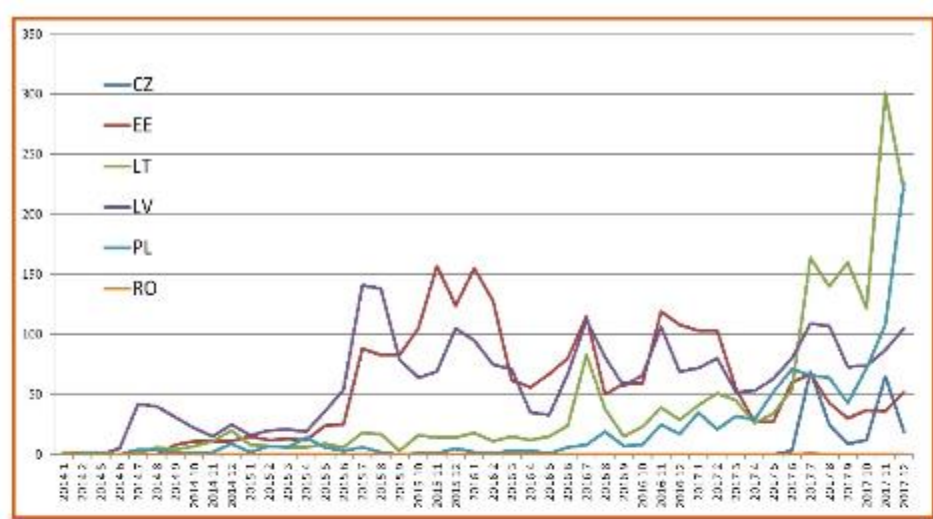
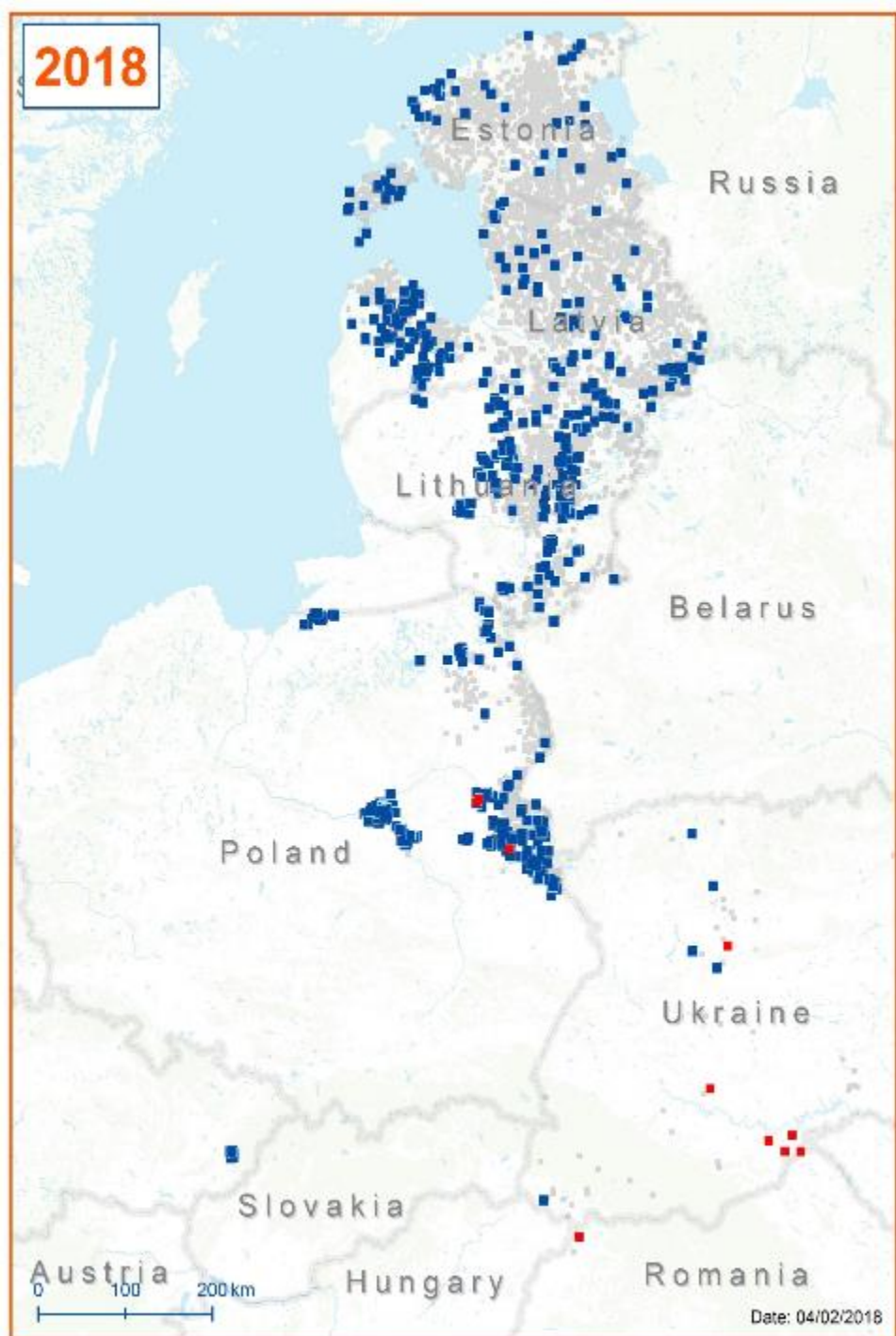
# 2017 epidemiological events: Czech Republic



# 2017 epidemiological events: Romania



2018



## African swine fever: risks

- *backyard farming*
- *wild boar habitats*
- *free-ranging pigs*
- *movement of contaminated vehicles*
- *illegal movement of animals/animal products*
- *poor on-farm biosecurity*
- *particular species of ticks*
- *and etc.*

## How does a pig / wild boar get infected?

ONLY by direct contact with infected material or sick animals!

- Feeding on garbage containing infected pig meat and/or pork products or carcasses;
- Contaminated fomites (premises, vehicles, clothes,...);
- Iatrogenic (needles, syringes, instruments...).

**Infected blood (blood cells) most risky material!!!!**

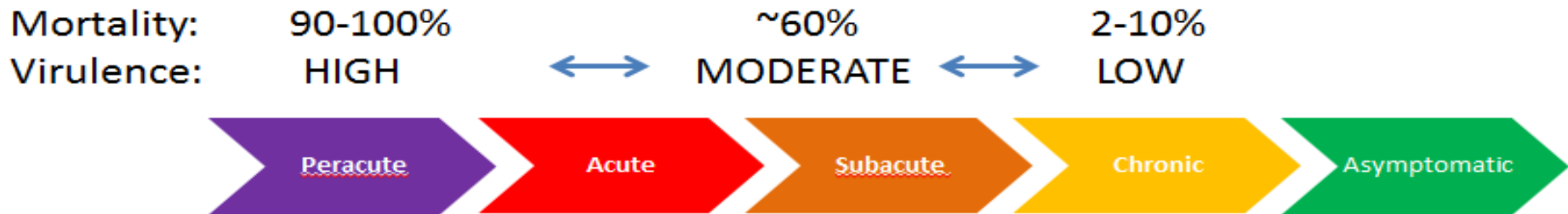
*Aerosol infection is unlikely...*

There is no report indicating the occurrence of *Ornithodoros* spp. in the affected Member States.

## Clinical presentation

- *Incubation period: 3-19 days;*
- *Pigs of all ages and gender;*
- *ASF is not so infectious, so some animals within the herd may not get affected;*
- *The spread of the disease within the herd varies;*
- *Some indigenous resistant breeds observed in Africa;*
- *Wild boar = domestic pigs.*

# Clinical presentation



## *Clinical signs highly variable*

- Depending on virus virulence, breed, route of exposure, infectious dose;
- Sometimes only fever and death, or unspecific signs;
- Presentation in the field not identical to experimental cases;
- Sometimes only death is observed;
- Clinical course may vary from 20% to 100%.



## ASF in Eastern Europe (acute form)

- Fever of 40-42°C;
- Lack of appetite;
- Animals are weak, lying down and huddling;
- Increased respiratory rate;
- Death within 3-15 days;
- Mortality rates up to 100% ;
- Acute forms are easily confused with other diseases (differential diagnosis);
- Animals usually in good body condition.



## Acute form of ASF

*One or several of the following:*

- **Bluish-purple areas and hemorrhages (spot like or extended) on the ears, abdomen, and/or hind legs;**
- **Ocular and nasal discharges;**
- **Reddening of the skin of the chest, abdomen, perineum, tail, and legs;**
- **Constipation or diarrhea, which may progress to bloody;**
- **Vomiting;**
- **Abortion of pregnant sows at all stages of pregnancy;**
- **Bloody froth from the nose/mouth and a discharge from the eyes;**
- **The area around the tail may be soiled with bloody faeces.**

*Note: The color changes and hemorrhages in the skin are easily missed in wild boar and dark-skinned/hairy pig breeds*

# Clinical signs and symptoms



# Clinical signs and symptoms



Consumer Health and Executive

# Clinical signs and symptoms



# Clinical signs and symptoms



# Post Mortem Lesions



# Post Mortem Lesions

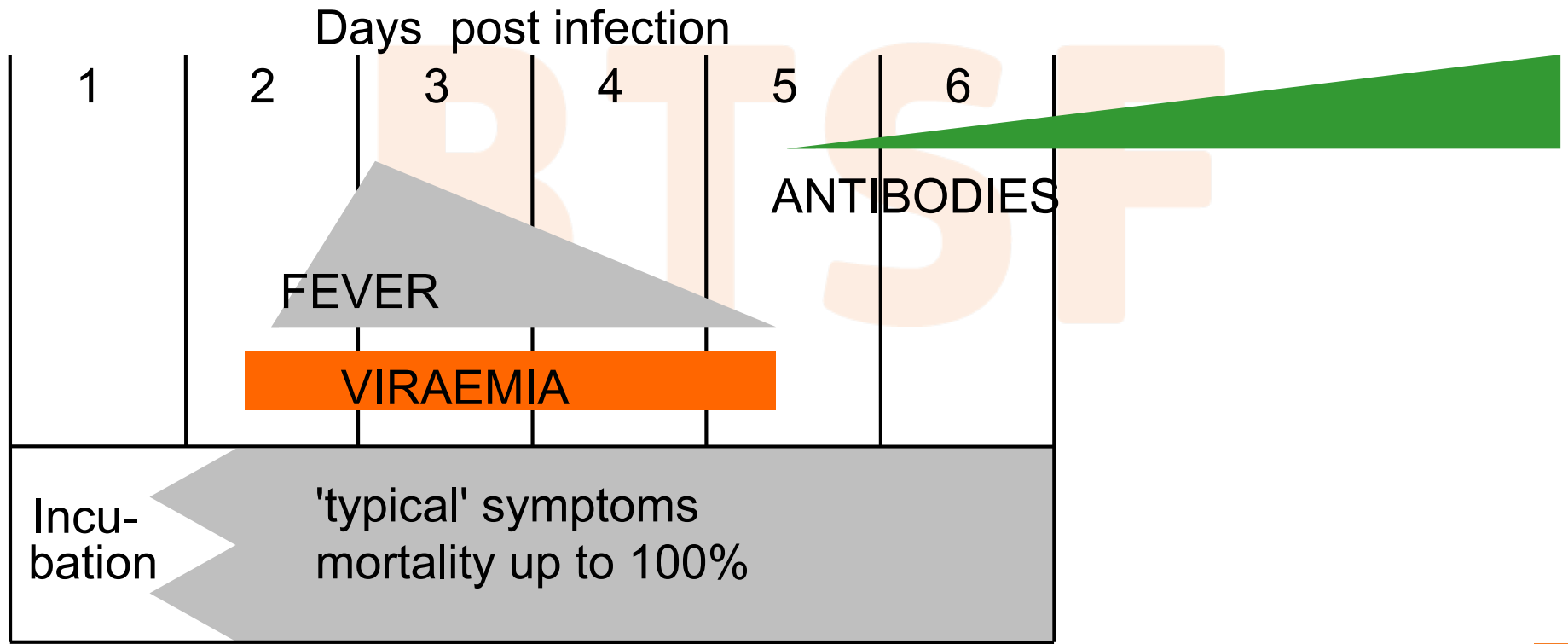




# Post Mortem Lesions



## Acute course of ASF



# ASF laboratory diagnosis

Virological and serological tests are largely available; ASF diagnosis is not a problem.

**MAIN AIM: virus detection with PCR from blood and / or organs – early detection!**

Antibodies are important for surveillance, when disease is longer time present in the infected country.

Test results can also be used for indicating the duration of infection

<i>PCR</i>	<i>Ab-Test</i>	<i>duration of infection (estimates)</i>
<b>pos</b>	<b>neg</b>	<12d (or the animal died/sampled before 12d)
<b>pos</b>	<b>pos</b>	>12d (or the animal died/sampled after 12d)
<b>neg</b>	<b>pos</b>	>24d (or the animals was sampled after 24d)

## Samples needed by the lab for ASF diagnosis

- Blood in EDTA (0,5%) for PCR  
Plus:
- **Organ samples (spleen, lymph nodes, tonsil, kidney) for PCR;**
- *Bone marrow - in case of old wild boar carcasses;*
- Serum - for ASF antibodies detection.

**BLOOD only could give false negative tests....always test  
ORGANS together with blood**

## Differential diagnosis

**Classical Swine Fever (CSF);**

**Erysipelas;**

Porcine Reproductive and Respiratory Syndrome  
(PRRS);

Salmonellosis;

Pasteurellosis;

Streptococcal infection;

Leptospirosis;

Circovirus infection;

Coumarin poisoning.

BTSF



**Thank you for your attention!**  
**Any questions?**



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