# 100th EDITION

## Global Disease Monitoring Report

NOV.2017 - MAR. 2026

SHIC
Swine Health Information Center
Made possible by pork checkoff

CENTER FOR ANIMAL HEALTH AND FOOD SAFETY
UNIVERSITY OF MINNESOTA

The **Global Disease Monitoring Report system** was developed by the **Center for Animal Health and Food Safety at the University of Minnesota** using a private-public-academic partnership including collaboration with the USDA/APHIS Center for Epidemiology and Animal Health (USDA-CEAH).

**One hundred editions of this report span nearly a decade of significant change in the global swine disease landscape.**

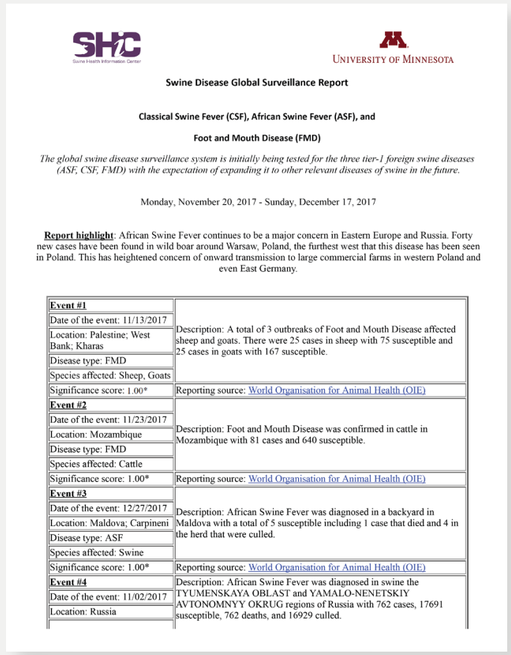
# Filling the Information Gap:
## How It All Began

The first Global Disease Monitoring Report (GDMR) was published in November 2017 to **provide U.S. pork producers with a clear overview of the global situation of transboundary swine diseases and support informed decision-making.**

At the time, **access to reliable and timely information was a major challenge as many outbreak reports were scattered across local-language sources, difficult to locate, time-consuming to verify, and often delayed or limited in detail in official reporting systems** such as WOAH. The report aimed to synthesize and verify this information, bringing key developments together in one accessible place.

Initially focused on African swine fever (ASF) and foot-and-mouth disease (FMD), the GDMR summarized global developments in a concise, practical format. A**s the disease landscape evolved, additional diseases, analytical sections, and deeper insights were incorporated into the monthly reports.** Over time, the audience expanded beyond U.S. pork producers to include animal health professionals and stakeholders worldwide.

**We continue to refine and improve the GDMR and welcome your suggestions. Please help us make it even better by completing our short survey.**



SHC Swine Health Information Center

UNIVERSITY OF MINNESOTA

**Swine Disease Global Surveillance Report**

**Classical Swine Fever (CSF), African Swine Fever (ASF), and**

**Foot and Mouth Disease (FMD)**

*The global swine disease surveillance system is initially being tested for the three tier-1 foreign swine diseases (ASF, CSF, FMD) with the expectation of expanding it to other relevant diseases of swine in the future.*

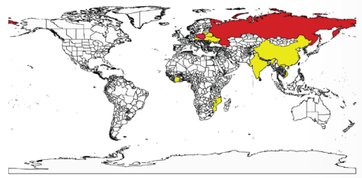
Monday, November 20, 2017 - Sunday, December 17, 2017

**Report highlight**: African Swine Fever continues to be a major concern in Eastern Europe and Russia. Forty new cases have been found in wild boar around Warsaw, Poland, the furthest west that this disease has been seen in Poland. This has heightened concern of onward transmission to large commercial farms in western Poland and even East Germany.

| | |
|---|---|
| **Event #1** | |
| Date of the event: 11/13/2017 | Description: A total of 3 outbreaks of Foot and Mouth Disease affected sheep and goats. There were 25 cases in sheep with 75 susceptible and 25 cases in goats with 167 susceptible. |
| Location: Palestine; West Bank; Kharas | |
| Disease type: FMD | |
| Species affected: Sheep, Goats | |
| Significance score: 1.00* | Reporting source: World Organisation for Animal Health (OIE) |
| **Event #2** | |
| Date of the event: 11/23/2017 | Description: Foot and Mouth Disease was confirmed in cattle in Mozambique with 81 cases and 640 susceptible. |
| Location: Mozambique | |
| Disease type: FMD | |
| Species affected: Cattle | |
| Significance score: 1.00* | Reporting source: World Organisation for Animal Health (OIE) |
| **Event #3** | |
| Date of the event: 12/27/2017 | Description: African Swine Fever was diagnosed in a backyard in Maldova with a total of 5 susceptible including 1 case that died and 4 in the herd that were culled. |
| Location: Maldova; Carpineni | |
| Disease type: ASF | |
| Species affected: Swine | |
| Significance score: 1.00* | Reporting source: World Organisation for Animal Health (OIE) |
| **Event #4** | |
| Date of the event: 11/02/2017 | Description: African Swine Fever was diagnosed in swine the TYUMENSKAYA OBLAST and YAMALO-NENETSKIY AVTONOMNYY OKRUG regions of Russia with 762 cases, 17691 susceptible, 762 deaths, and 16929 culled. |
| Location: Russia | |

| | |
|---|---|
| | pending confirmation from the state laboratory. If the outbreak is verified, all pigs at the feeding station will have to be culled. |
| Significance score: 2.00* | Reporting source: Reuters |
| **Event #17** | |
| Date of the event: 02/01/2017 | Description: Since February 2017, the State Service of Ukraine for Food Safety and Consumers Rights Protection has recorded 140 cases of African Swine Fever with 111 of the cases being in private households. |
| Location: Ukraine | |
| Disease type: ASF | |
| Species affected: Swine | |
| Significance score: 1.00* | Reporting source: Interfax Ukraine |
| **Event #18** | |
| Date of the event: 12/06/2017 | Description: African Swine Fever was confirmed in livestock in the Sredneakhtubinsky, Russia. The diagnosis was established by the regional veterinary laboratory and sent for confirmation to the All-Russian Scientific Research Institute of Veterinary Virology and Microbiology. No other details were available at this time. |
| Location: Russia; Sredneakhtubinsky | |
| Disease type: ASF | |
| Species affected: Swine | |
| Significance score: 1.00* | Reporting source: http://volga-kaspiy.ru/ |
| **Event #19** | |
| Date of the event: 11/23/2017 | Description: African Swine Fever was diagnosed in 2 wild boar. Restrictive measures have been taken in the area for the transport of pigs and manure. |
| Location: Poland; Legionowski | |
| Disease type: ASF | |
| Species affected: Wild Boar | |
| Significance score: 2.00* | Reporting source: Boerderij.nl |

***Significance score**: A scoring system to assess the likelihood a disease event will impact the global swine industry. Scores range from 1-3 (low-high) based on the novelty of the disease, effect on the swine industry, and impact on trade.*



The locations of countries mentioned in this report are colored in the above map according to significance score (1: yellow, 2: red, 3: black).

Figure 1. Example of an early Global Disease Monitoring Report (November 20–December 17, 2017)





# GDMR by the Numbers

**100** REPORTS
NOV. 2017 - MAR. 2026

**92** included **Epidemiological Interpretation**

**42** included **Additional "Fact box" information**

**ASF** most highlighted disease, included **100 times**

From Nov. 2017 - Mar. 2026
**ASF expanded** from:

**36** countries
**2** continents

**58** countries
**4** continents

CRITICAL EVENTS

**2018** The **virus reached China**, the world's largest pork producer

**2020** **Germany outbreak** highlighted the risk of long-distance spread

**FMD** second most highlighted disease, included **75 times**

**39** **spread events** across multiple regions.

## Potential Impact on the US Market

A multi-criteria rubric is applied to evaluate each event. This rubric assesses factors like novelty and the potential direct and indirect financial impacts on the US market. The outcome of this rubric application is a **final score** assigned to each event.

| Significance Score | Total events | ASF events | FMD events |
|---|---|---|---|
| ① Blue: **no change** in status | 480 | 326 | 117 |
| ② Red: needs **extra attention** as the situation is dynamic | 176 | 137 | 30 |
| ③ Black: **requires consideration** or **change in practices** to reduce exposure | 4 | 4 | – |

**CSF** (Classical Swine Fever)

The virus is present in approximately **14** countries

CRITICAL EVENT

**2018**
disease reemerged
in Japan after 26 years of mantaining a disease-free status

**JEV** (Japanese Encephalitis)

The virus is present in approximately **24** countries

CRITICAL EVENT

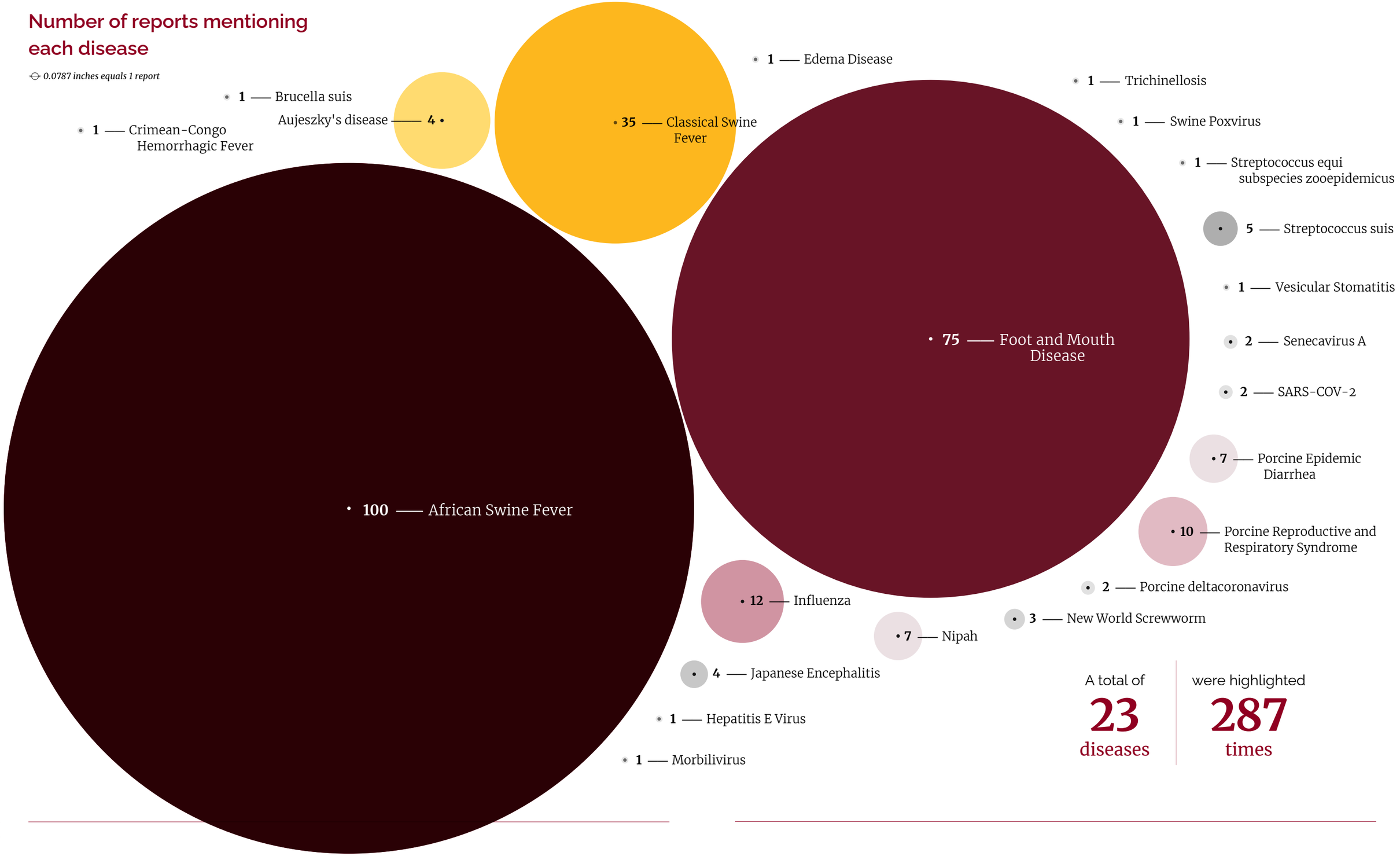
**2022**
outbreak
represented a major geographic **expansion of the virus** in Australia

**Smuggling**

**60** reports have highlighted **102** news releases about smuggling and other related illicit activities

# Number of reports mentioning each disease

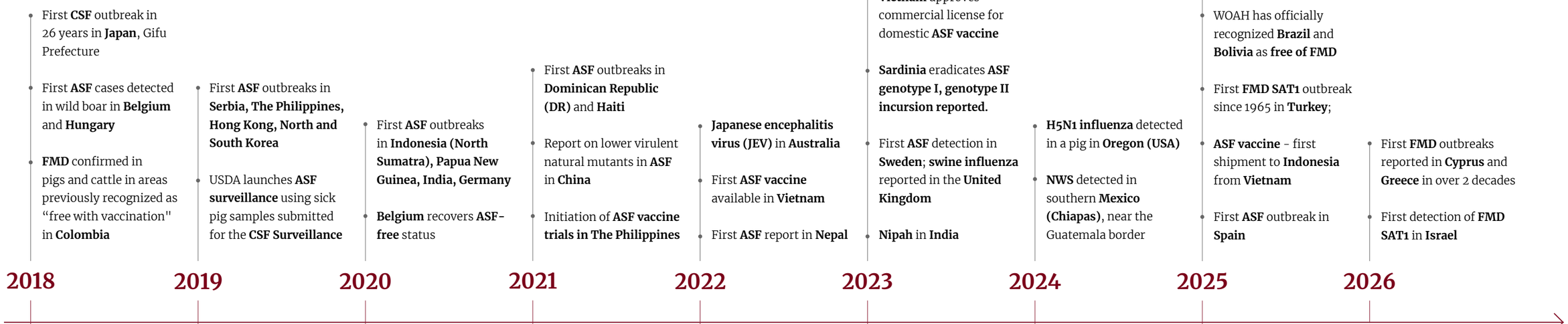
*0.0787 inches equals 1 report*




A total of **23** diseases were highlighted **287** times

# Major Global Swine Disease Milestones, 2017– 2026

The following timeline captures the major swine disease events recorded since the first report was issued in November 2017, highlighting the dynamic and evolving nature of the global swine disease landscape.




**Event of the year: ASF in China.** ASF devastated the Chinese pig population (roughly half of the world's pigs), triggering an unprecedented global restructuring of meat trade and feed markets, with ripple effects on food security from South East Asia to Europe.

**Event of the year: First detected ASF in The Philippines.** Frst detected in farms in Rizal province, the virus quickly spread to other provinces in Luzon, including Bulacan, Pampanga, and Nueva Ecija, by October 2019.

**Event of the year: ASF in Germany.** The first case was confirmed in a wild boar near the Polish border in Brandenburg. The outbreak led to immediate export bans on German pork by major markets like China, South Korea, and Japan, severely impacting the pork industry.

**Event of the year: ASF in DR and Haiti.** First re-emergence of ASF in the Americas in 40 years, with both nations having been previously declared free of the disease in the 1980s after similar eradication efforts.

**Event of the year: JEV in Australia.** The Japanese encephalitis virus (JEV) outbreak in Australia, marks the first major, widespread emergence of the disease in southern temperate regions. Spreading via mosquitoes and waterbirds to pigs, it caused 46 reported human cases, with ongoing detection of endemic transmission across New South Wales, Victoria, Queensland, and South Australia.

**Event of the year: Recombinant ASF (genotype I and II) in China.** These novel strains possess increased genetic complexity, complicating diagnostic efforts and challenging vaccine development.

**Event of the year: NWS in Mexico.** New World Screwworm (NWS) cases were confirmed in southern Mexico in November 2024, marking a significant northward spread of the flesh-eating parasite after sweeping through Central America. The outbreak has prompted emergency responses from both Mexican and U.S. authorities due to its potential to devastate the American livestock industry.

**Event of the year: FMD outbreaks in Germany, Hungary, and Slovakia** These outbreaks marked a rare re-emergence of the disease in Europe, underscoring that no country is exempt from risk and reinforcing the need for strong preparedness and early detection systems.

- First **CSF** outbreak in 26 years in **Japan**, Gifu Prefecture
- First **ASF** cases detected in wild boar in **Belgium** and **Hungary**
- **FMD** confirmed in pigs and cattle in areas previously recognized as “free with vaccination" in **Colombia**
- First **ASF** outbreaks in **Serbia, The Philippines, Hong Kong, North and South Korea**
- USDA launches **ASF surveillance** using sick pig samples submitted for the **CSF Surveillance**
- First **ASF** outbreaks in **Indonesia (North Sumatra), Papua New Guinea, India, Germany**
- **Belgium** recovers **ASF-free** status
- First **ASF** outbreaks in **Dominican Republic (DR)** and **Haiti**
- Report on lower virulent natural mutants in **ASF** in **China**
- Initiation of **ASF vaccine trials in The Philippines**
- **Japanese encephalitis virus (JEV)** in **Australia**
- First **ASF vaccine** available in **Vietnam**
- First **ASF** report in **Nepal**
- New **FMD strain (SAT2)** in **Türkiye**
- **FMD** re-emerges in **South Korea**
- Recombinant **ASF (genotype I and II)** in **China**
- **Vietnam** approves commercial license for domestic **ASF vaccine**
- **Sardinia** eradicates **ASF genotype I, genotype II incursion reported.**
- First **ASF** detection in **Sweden**; **swine influenza** reported in the **United Kingdom**
- **Nipah** in **India**
- **H5N1 influenza** detected in a pig in **Oregon (USA)**
- **NWS** detected in southern **Mexico (Chiapas)**, near the Guatemala border
- First **FMD** outbreaks in **Germany**, **Hungary**, and **Slovakia**
- First **JEV** outbreaks confirmed in swine since July 2022 in **Australia**
- **Germany's FMD-free** status has been reinstated
- WOAH has officially recognized **Brazil** and **Bolivia** as **free of FMD**
- First **FMD SAT1** outbreak since 1965 in **Turkey**;
- **ASF vaccine** - first shipment to **Indonesia** from **Vietnam**
- First **ASF** outbreak in **Spain**
- First **FMD** outbreaks reported in **Cyprus** and **Greece** in over 2 decades
- First detection of **FMD SAT1** in **Israel**

# **Smuggling events:** News releases about smuggling and other related illicit activities

Illegal movement of animals and animal products is one of the primary pathways by which transboundary animal diseases enter new regions, bypassing the biosecurity and surveillance systems designed to detect and contain them.

### Smuggled products by type

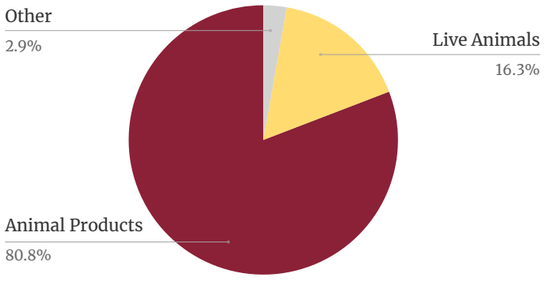



Figure 2. Percentage of news releases reporting each item type in smuggling events.

### Smuggled animals by species

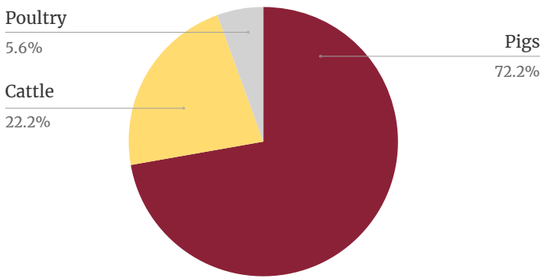



Figure 3. Percentage of news releases reporting each species of animal in smuggling events. One summary included both cattle and poultry.

Since this section was first included in a report in January 2019, **60 monthly reports have highlighted 102 news releases about smuggling and other related illicit activities**, including illegal sale of pork products, illegal slaughter, and illegal use of vaccines.

Fourteen of these news releases were summaries covering three months to a year of smuggled items and animals caught by the reporting country's customs or border protection agency. Animals and products were smuggled into countries across all major world regions, with the greatest concentration in Europe, where the United Kingdom accounted for a disproportionate share of documented seizures, reflecting the region's higher border monitoring intensity. Asia, particularly Southeast and East Asia, also had high numbers of smuggling and illicit activities. Some reports indicated that shortages of pork and other animal products in the country contributed to an increase in smuggling events; other reports indicated an increase in smuggling was observed when border restrictions were tightened. *For this analysis, only events with confirmed evidence of smuggling or other illegal activity were included; events where illegal movement was suspected but unverified were excluded.*

Seventeen reports included illegal movement, with over 161,000 live animals seized; smuggled animals included **pigs, cattle, and poultry**. Six of these events were attempts to smuggle animals across international borders, ten were illegal movements within the originating country, and one was the illegal sale of sick animals. **In four of these events, the animals were tested for disease, and in all cases of testing, the animals were found to be positive for ASF**. Two





cases, in which the pigs were successfully smuggled into a new region of the country, are suspected to have resulted in an ASF outbreak. Both these cases occurred in Chongqing Municipality, China, in 2020; the first occurred due to the illegal transport of 298 pigs, and the second occurred after 70 piglets were illegally transported into the city as determined by epidemiological investigations conducted and published by local veterinary authorities.

Of the 84 reports, those that quantified seized volumes totaled over 7,396 tons. Animal products frequently smuggled include pig carcasses, pork meat and other products, meat from other animals, hides, fish and aquatic animal products including dried seahorses, and parts of reptiles and amphibians. In some cases, products are shipped with falsified documents or were otherwise mislabeled. In other cases, products are shipped with other legally imported goods to conceal the illegal goods. Some products were carried by travelers or shipped by mail or air freight. Usually, these were small amounts, such as a ham sandwich. One instance of traveler-carried pork and other animal products led to Australia's first visa revocation for food-related reasons, when a traveler from Vietnam was found with 10 kg of quail, squid, and pate in her luggage.

Other events included two instances of commercialization or use of unregistered vaccines. In December 2019, unauthorized experimental vaccines were provided to pig farmers in China; the vaccinated pigs suffered complications, and some died from ASF infection. Imported and 'homemade' unauthorized vaccines were reported in China in the same month. In February 2024, unauthorized vaccines were sold by two individuals in the Philippines; the vaccines were seized in the investigation. **Non-compliant vaccine use is associated with increased risk to pigs, including inadequate protection against infection**. *See the text box below for more details on these risks.*

**Illegal movement of animals and animal products, illegal sale and slaughter, illegal swill feeding, and illegal use of vaccines contribute to an enabling environment for disease incursion and spread**; each instance may not be sufficient to allow disease entry, but when coupled with other risk factors such as favorable ecological conditions and poor biosecurity, the risk of disease increases.

#### The Risks of Using Poor-Quality or Non-Compliant Vaccines

The use of non-compliant and poor-quality vaccines may not confer any protection against ASF and risks spreading vaccine viruses that could result in acute or chronic disease. Additionally, these vaccine viruses could recombine with field strains to generate novel strains that could evade detection and result in acute, chronic, and persistent ASF infections on farms.

Source: WOAH — African Swine Fever: WOAH Warns Veterinary Authorities and Pig Industry of Risk from Use of Sub-Standard Vaccines

### Smuggled animal products by type

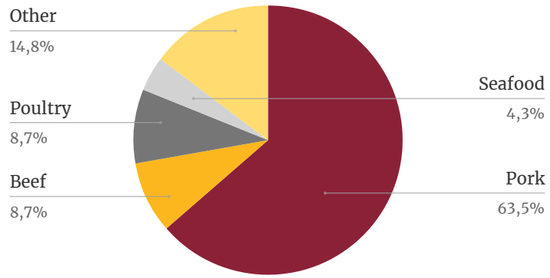



Figure 4. Percentage of news releases indicating presence of each type of product. Some smuggling events included more than one type of product.

### Smuggling events by type

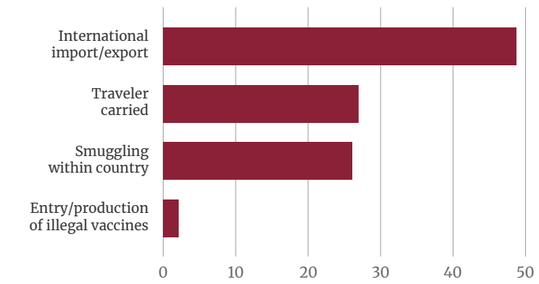



Figure 5. Count of each type of smuggling event reported since 2019.

# News releases

Smuggling and the illegal movement of animal and animal products continue to pose a **significant risk for disease incursion**, with **border agencies around the world intercepting illicit pork and meat products** on a regular basis.

Even small quantities of undeclared **animal products carried by individual travellers** represent a meaningful pathway for disease spread.

**Read some of the news** that were included on the reports.

All images featured in this spread belong to their respective sources, as credited via the provided links.


Vietnamese tourist denied entry into Taiwan over undeclared pork snack

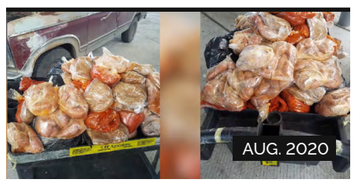

Meat Contraband from China Hit Record Levels


Australia tightens border security due to ASF fears


ASF and FMD found in pork products at border seizure


Meat infected by African swine fever found in UK for first time


CBP Seizes Over 300 Pounds of Pork Bologna and Turkey Ham




CBP officers seize over 200 pounds of pork


Animal food contraband from China remains at record levels at seaport


Federal agents seize nearly 20000 pounds of illegal meat


CBP seizes 124 pounds of pork, poultry at Laredo Port of Entry

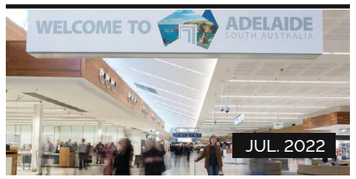





FMD fragments detected in meat imported to Australia


Pork seized by Hull inspectors in fight against African swine fever


Traveler stopped at Dulles airport with 77 dry seahorses, 5 dead snakes




Foot and mouth viral fragments found at Adelaide Airport

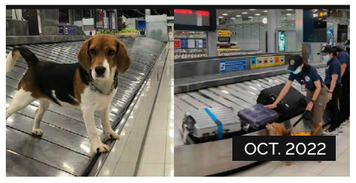

To Prevent ASF Virus, Trucks with 198 Pigs in North Toraja Detained


4,300 tonnes of smuggled pork to be buried


Amid flu fears, Thailand destroys 24 tonnes of smuggled pork


4 million kg. of smuggled pork to be destroyed

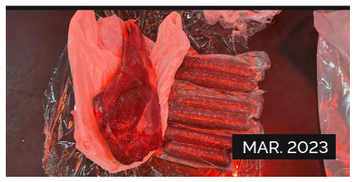

Fighting pork smugglersPost PCL. All rights reserved.




K9 beagle sniffs out 9kg of sausages at Bangkok customs

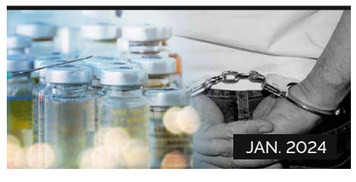

Spoiled frozen meat valued at P35 million seized in Bulacan raid


A novel ASF has been detected in pork products carried by travelers




One tonne of smuggled pork seized at ports of Felixstowe and Harwich


Illegal pork sausages sniffed out, preventing ASF outbreak at Bangkok




Smuggled ASF vaccines seized by authorities

# Global Expansion and Evolution of African Swine Fever, 2017–2026

From 2017 to 2026, the global epidemiology of African swine fever (ASF) has shifted from a relatively regionally contained disease to a widespread panzootic affecting multiple continents.

In 2017, according to WOAH, **ASF was largely confined to Africa (26 countries reporting to WOAH, though surveillance capacity varied significantly across the continent), and parts of Europe (10 countries)**, with no confirmed presence in Asia, the Americas, and Oceania. **By 2026, ASF had expanded substantially both within and across continents**, with confirmed presence in **17 countries in Africa, 22 in Europe, and 16 countries in Asia (plus Hong Kong), as well as re-emergence in the Caribbean**. ASF has not been reported in Oceania or in the Americas outside the Caribbean. *Note: several countries in Oceania had no information on ASF prevalence in 2017 and 2026.*

Farm visiting in The Philippines, June 2023. Source: CAHFS

A major turning point occurred in 2018 when **ASF reached China, the world's largest pork producer, leading to rapid dissemination across Asia**. In Europe, the **detection of ASF in Germany in 2020 marked a critical moment for international trade and highlighted the risk of long-distance spread**, which has since been observed in countries such as Italy, Sweden, and most recently Spain. In the Americas, the reintroduction of ASF in 2021 in the Dominican Republic underscored the continued risk of transboundary spread.

Globally, the current epidemic is driven primarily by ASF virus genotype II (Georgia 2007/1 lineage), which circulates across Europe, Asia, and the Caribbean. At the same time, genotype I remains endemic in West Africa and has re-emerged in China as a lower-virulence form, while novel recombinant genotype I/II strains with high lethality are increasingly reported.

A major turning point occurred in 2018 when ASF reached China, the world's largest pork producer, leading to rapid dissemination across Asia.

Notably, Sardinia successfully eradicated genotype I in 2024 after decades of endemic circulation. Recent findings from Spain further indicate ongoing viral evolution, with identification of a distinct variant (referred to as group 29) showing genetic deletions and mutations, and potentially reduced virulence compared to typical European strains. Together, **these developments highlight not only the geographic expansion of ASF but also increasing genetic diversity and complexity of the virus**, posing continued challenges for global control efforts.





## African Swine Fever presence by country 2017

**26**
Countries in Africa

**10**
Countries in Europe

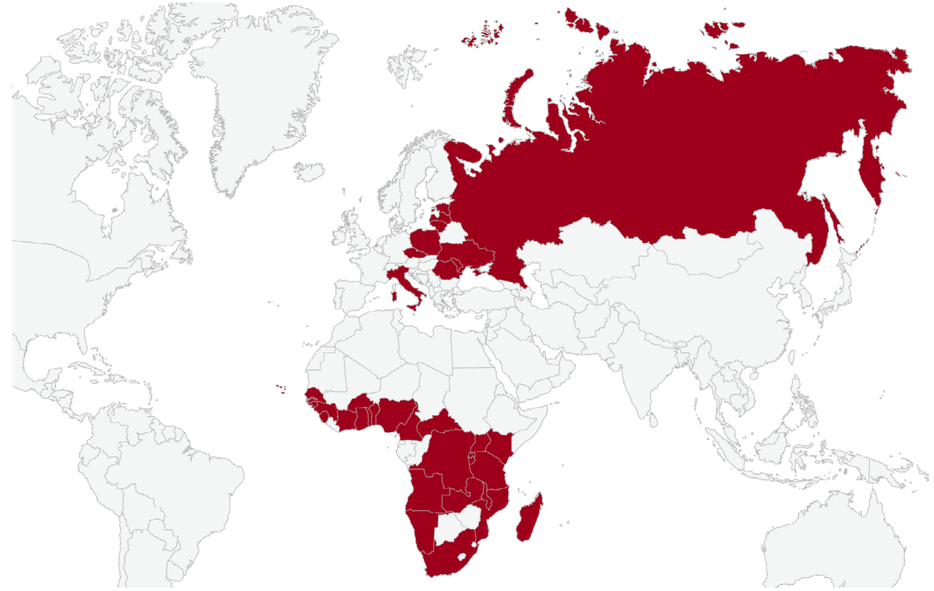


Figure 6. A map illustrating the spread of African Swine Fever by the year 2017

## African Swine Fever presence by country 2026

**17**
Countries in Africa

**22**
Countries in Europe

**16**
Countries in Asia*
*Plus Hong Kong

**2**
Countries in Americas

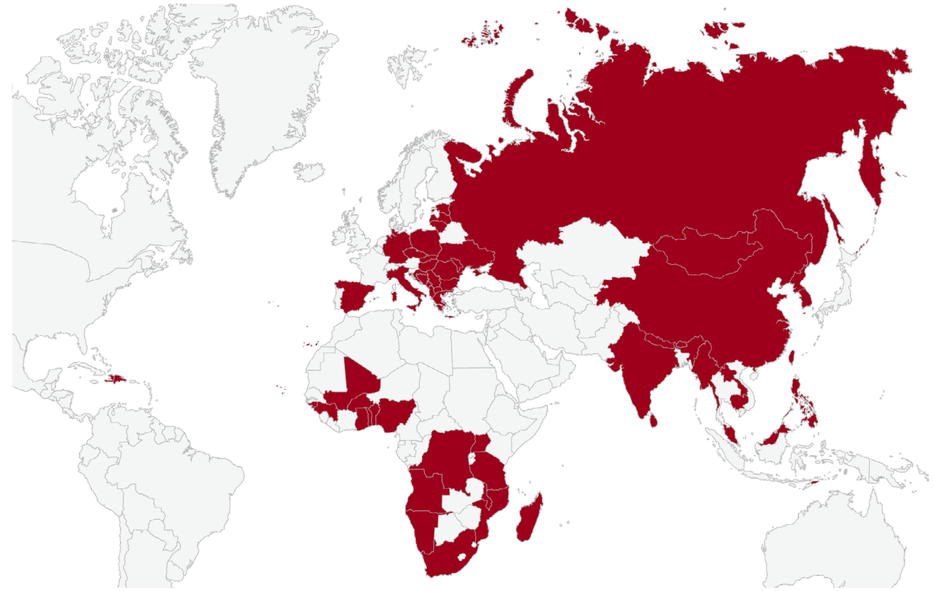


Figure 7. A map illustrating the spread of African Swine Fever by the year 2026

# Transboundary movement of FMDV serotypes between 2017 and 2026

Between 2017 and early 2026, at least 39 documented foot-and-mouth disease virus (FMDV) spread events were reported across multiple regions.

Ruptured oral blister in a diseased cow. Source: Unknown author - USDA online photography center [1] — Image Number: 01cs0006, Public Domain

Animal and animal product trade and transport, both legal and illegal, are recognized as primary pathways

These events involved the **movement of diverse serotypes and lineages between endemic virus pools (the regions where FMDV circulates continuously in animal populations) and into new areas**.

These events reflect continued transboundary circulation of FMDV, with repeated introductions from Africa and Asia into the Middle East and, into parts of Europe.

**Serotype O accounted for the largest proportion of spread events during this period**, with detections spanning Africa, Asia, and Europe. In parallel, **serotypes SAT2 and, more recently, SAT1 have expanded beyond their traditional endemic zones** in sub-Saharan Africa, with multiple incursions into the Middle East since 2022. Notably, a wave of **SAT1 outbreaks linked to East Africa was reported across several countries in Western Asia in 2025 and early 2026**, including Bahrain, Kuwait, Türkiye, Lebanon, Israel, Cyprus, and Greece.

**East Africa has emerged as a consistent source of recent FMDV movement, contributing to the spread of O, SAT1, and SAT2 serotypes**. Many of these introductions have been detected in countries within the West Eurasia and Middle East region, which continues to function as a **convergence zone for viruses originating from multiple endemic pools**. Egypt and Türkiye appear repeatedly in reporting, reflecting their roles as epidemiological interfaces between Africa, Asia, and Europe.

Beyond spreading locally, this report highlights several instances of FMDV being carried over longer distances, including new introductions into Europe and detections





far outside the usual virus endemic hotspots. The **mechanisms driving these long-distance movements are not always fully documented; however, animal and animal product trade and transport, both legal and illegal, are recognized as primary pathways**. These events underscore the ongoing risk of FMDV introduction into previously unaffected territories and free regions.

The **geographic distribution of FMDV serotype spread events is illustrated in the accompanying map**, and further detail on individual virus strains, inferred origins, and year of detection is provided in the linked table.

## Notable transpool reports of FMDV serotypes and lineages

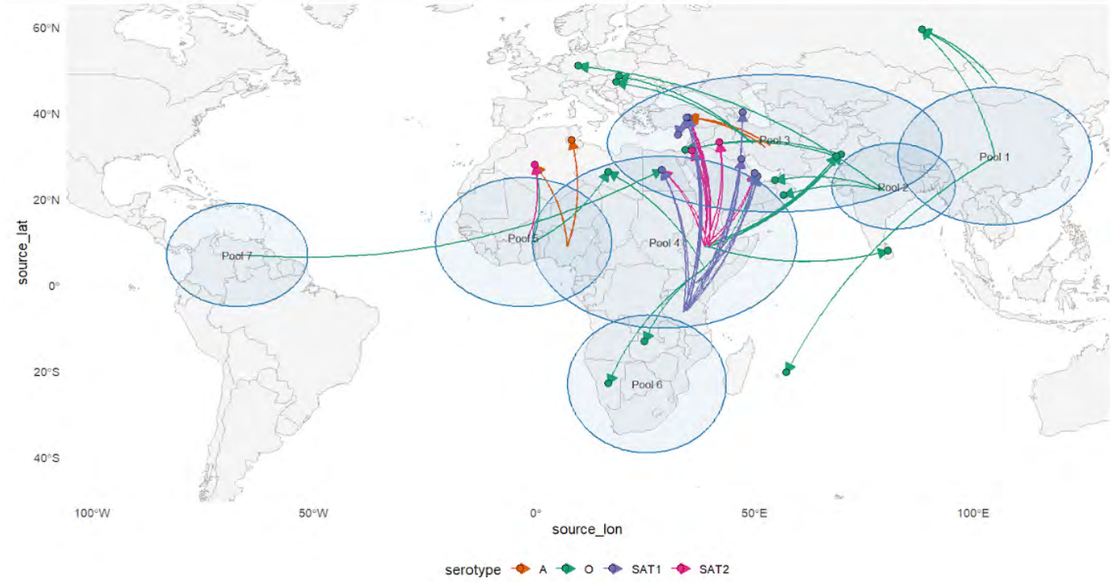



Figure 8: A map illustrating the spread of FMDV serotypes across endemic disease pools from 2017 to 2026. Serotype A is shown with orange arrows, serotype O with green arrows, SAT1 with purple arrows, and SAT2 with maroon arrows. Arrows indicate the direction of virus movement between origin and destination. The map is adapted from the FMD endemic pools described by the World Reference Laboratory for Foot-and-mouth disease, with modifications to highlight inter-pool spread of virus serotypes. The oval shapes represent endemic pools or hotspots and are not drawn to scale. They are included for illustrative purposes only.

# JEV Emergence in Australia:
## A Wake-Up Call for Global Surveillance

The 2022 emergence of Japanese Encephalitis (JEV) in Australia represented a major geographic expansion of the virus beyond its historically recognized endemic range

### Global Burden and Transmission of JEV

- JEV is an important endemic and emerging vector-borne disease globally, particularly in Asia and the western Pacific, where it is the leading cause of viral encephalitis.
- The virus is present in approximately 24 countries and places with more than three billion people at risk].
- An estimated 50,000–100,000 clinical cases occur annually, though the true burden is likely higher due to underdiagnosis and asymptomatic infections.
- Transmission is primarily associated with rural environments with mosquito exposure.
- Water birds serve as reservoir hosts, while mosquito populations increase during rainy or monsoon seasons, facilitating virus spread.

Prior to this event, JEV activity in Australia had largely been limited to the northern region; the **2022 outbreak resulted in widespread detections across New South Wales, Victoria, Queensland, and South Australia**. The event was first identified through reproductive losses and stillborn piglets in commercial piggeries, before recognition of human infections, underscoring the **value of livestock surveillance as an early warning system for zoonotic disease**.

Extensive rainfall and flooding associated with the La Niña climate pattern created favorable conditions for mosquito population growth and increased contact among vectors,

### Residential location of human JEV cases

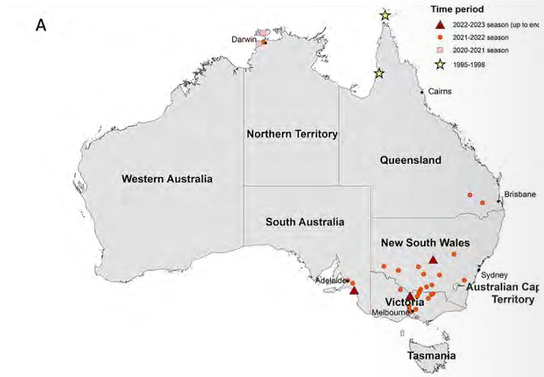
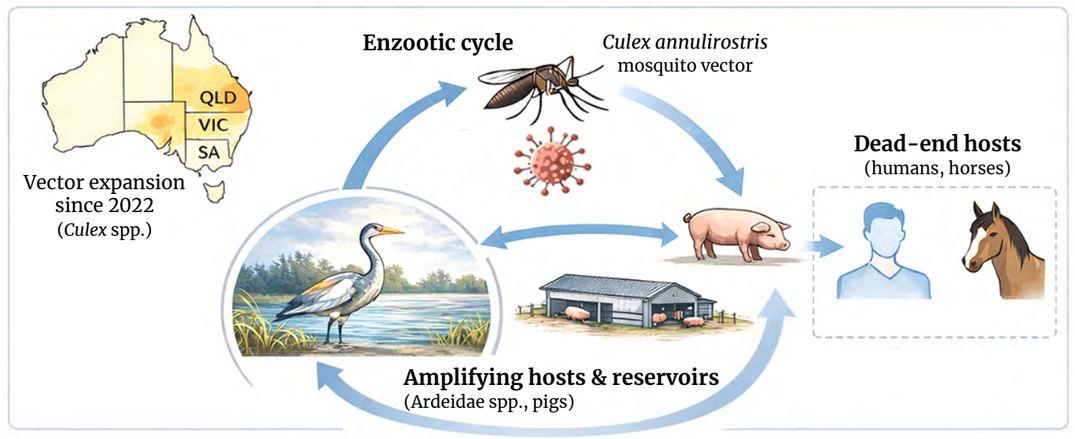



Figure 9: Residential location for 40 of 46 human JEV cases in the 2021–2023 outbreak as well as all five cases in historical JEV outbreaks, from 1995 and 1998, in Australia. The location of symbols corresponds to the Local Government Area (LGA) of residence of cases and may not reflect place of exposure. More than one case was reported for some LGAs. Figure adapted from https://pmc.ncbi.nlm.nih.gov/articles/PMC10075061/.





Japanese Encephalitis Virus Epidemiology in Australia




Over 80 pig farm sites affected across New South Wales, Queensland, Victoria, and South

wildlife, pigs, and humans, illustrating how **climatic and ecological factors can combine to enable rapid geographic expansion of vector-borne pathogens**.

In response, Australia substantially expanded surveillance activities, including enhanced mosquito trapping, targeted piggery monitoring, increased diagnostic testing, and improved data sharing across public health, agricultural, and environmental sectors. Ongoing detections in subsequent seasons suggest JEV may now be established in parts of the country.

The Australian outbreak highlights a **broader global concern**: several competent Culex species occur **outside the virus's traditional endemic range**, and many regions contain suitable host populations and environmental conditions that could support transmission cycles.

Current global surveillance **priorities emphasize vector monitoring, pig and wildlife surveillance, vaccination strategies, and integration of environmental and climate indicators** to identify conditions conducive to emergence, an approach that exemplifies the **One Health framework** increasingly central to transboundary disease monitoring.

Climatic and ecological factors can combine to enable rapid geographic expansion of vector-borne pathogens

# **Layers of defense:** disease complexity, wildlife reservoirs, and the limits of single interventions

The disease events documented across this report share a recurring pattern: no single intervention, surveillance, trade restriction, biosecurity, or vaccination, has proven sufficient on its own to prevent the introduction or spread of transboundary animal diseases.

This is not a failure of individual tools but a reflection of the underlying **biological and ecological complexity that drives disease persistence, particularly where wildlife reservoirs are involved**.

No single layer of protection is impermeable, but multiple overlapping layers, each addressing a different point of vulnerability, collectively reduce the probability that a pathogen reaches a susceptible host.

**Classical swine fever (CSF) in Japan illustrates this complexity in detail.** Japan maintained CSF-free status for 26 years before the disease reemerged in 2018, with contaminated meat identified as the likely source of initial introduction, a reminder that **illegal or uncontrolled movement of animal products**, documented extensively elsewhere in this report, represents a **primary pathway for disease entry**. Once introduced, **the virus spread rapidly into wild boar populations**, which subsequently became the **principal driver of persistence and the main obstacle to eradication. Despite the availability of effective vaccines, initial stamping-out measures failed to contain the outbreak, and the subsequent combination of vaccination in wild boars, intensified biosecurity, and surveillance managed to slow but not halt transmission**. Japan has not regained CSF-free status, and recurrent outbreaks continue, sustained by persistent viral circulation in wild boar populations that vaccination of domestic pigs alone cannot address.

These cases carry **direct implications for the current global conversation about African swine fever vaccines**. The development of a safe and effective ASF vaccine would represent a significant advancement, but the experience with CSF in Japan and elsewhere suggests that vaccine availability, **without concurrent management of the wildlife interface, is unlikely to be sufficient for eradication or sustained freedom**. Where wild boar populations serve as





**Swiss Cheese Model: Succesive layers of protection**

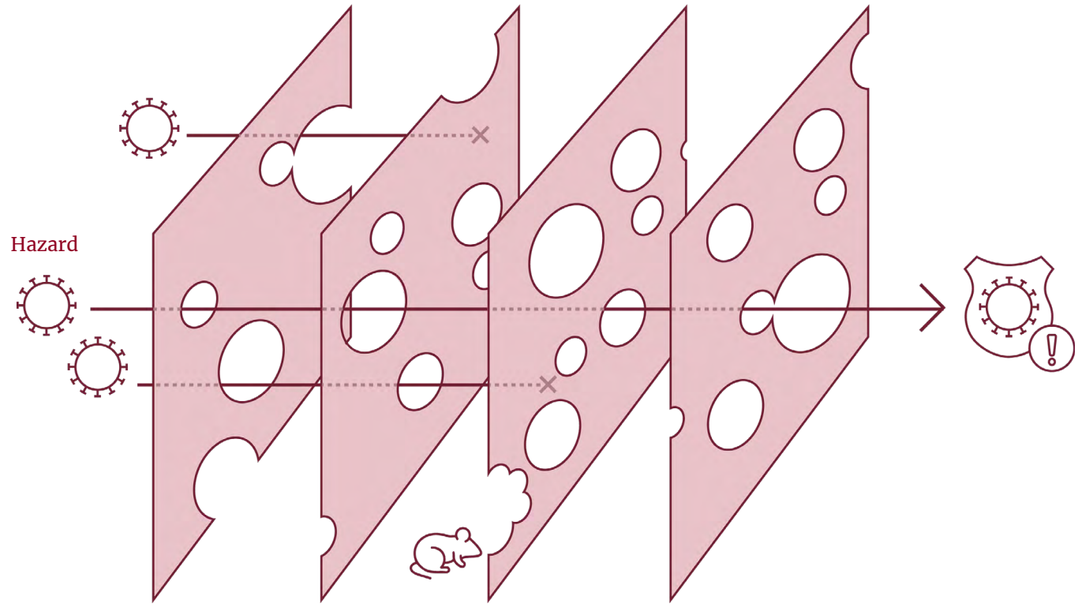



Figure 10: Adapted from Mackay, 2020 and "Swiss cheese model," 2025.

maintenance hosts, as they do across much of Europe and Asia for ASF, **vaccination of domestic pigs addresses only one part of a multicomponent transmission system**.

This is the core insight of J**ames Reason's Swiss Cheese Model** as applied to infectious disease risk: **no single layer of protection is impermeable, but multiple overlapping layers, each addressing a different point of vulnerability, collectively reduce the probability that a pathogen reaches a susceptible host**.

In the context of transboundary swine diseases, those layers include **international trade and movement controls, border biosecurity and surveillance, farm-level biosecurity, vaccination where available and applicable, wildlife population management, and robust diagnostic and reporting infrastructure**.

Strength of the system lies not in any individual layer but in their combined and sustained operation

The **strength of the system lies not in any individual layer but in their combined and sustained operation**. As the events documented in this report consistently demonstrate, **gaps in any one layer** - whether through illegal animal movement, surveillance failures, biosecurity lapses, or unmanaged wildlife interfaces - **create the conditions under which disease introduction and spread become possible**, regardless of what other protections are in place.

# Where do we go from here?
## Conclusion

One hundred editions of this report span nearly a decade of significant change in the global swine disease landscape. **When the first report was published, African swine fever had not yet reached Asia or the Americas, Japanese encephalitis virus had not emerged in southeastern Australia, and the transboundary spread of foot-and-mouth disease virus serotypes from East Africa into Western Asia was not yet an established pattern**. What these reports document collectively is **not simply a list of disease events but a consistent trajectory**: pathogens moving farther and through more diverse pathways, the role of wildlife reservoirs becoming better understood but still harder to manage, and the genetic complexity of circulating viruses increasing. What these reports document collectively is not simply a list of disease events but a consistent trajectory: pathogens moving farther and through more diverse pathways, the role of wildlife reservoirs becoming better understood but harder to manage, and the increasing genetic complexity of circulating viruses. The illegal movement of animals and animal products, the limits of single-intervention strategies, and the importance of sustained multilateral surveillance are consistent themes across 100 editions.

Our goal remains what it was at the outset: to **provide timely, verified, and actionable information that helps producers, veterinarians, researchers, and animal health professionals understand global disease risks and make informed decisions**. That goal has not changed, but the landscape it operates in has, and this report will continue to evolve with it.

As we enter the next hundred editions, we **remain committed to near-real-time event-based surveillance, rigorous verification, and analysis that serves the swine industry and the broader animal health community**. To ensure this report continues to meet your needs, we invite you to **share your feedback through our short survey**. Your continued input will shape what comes next.

Please share your feedback completing our short survey.



Global Disease Monitoring Report 100th EDITION