

OFFLU – A global network of expertise on animal influenza

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The OIE and FAO Influenza (OFFLU) network includes avian, swine and equine influenza experts with the capability to detect and investigate animal influenza around the world. OFFLU works through scientist groups to address priority influenza-related issues.

Abstract

Pigs and humans have shared influenza A viruses (IAV) since 1918, and many interspecies transmission events have been documented. Despite this interplay, relatively little is known regarding IAV circulating in swine around the world compared to what is known for avian and human IAV. This gap impedes our understanding of how swine- and human-adapted viruses impact the ecology and evolution of IAV as a whole and the true impact of swine IAV on human health. The pandemic H1N1 of 2009 underscored the need for greater surveillance and sharing of data on IAV in swine. Here, we review the current state of IAV in swine around the world, highlight the collaboration between international organizations and a network of laboratories engaged in human and animal IAV surveillance and research, and emphasize the need to increase information in high priority regions. The need for global integration and rapid sharing of data and resources to fight IAV in swine and other animal species is apparent, but this effort requires grassroots support from government, practicing veterinarians and the swine industry and, ultimately, requires significant increases in funding and infrastructure.

OFFLU Swine Influenza Virus Group

Aims to strengthen and coordinate IAV surveillance and research in pigs worldwide, harmonize approaches to diagnostics and surveillance, and provide a platform for data exchange.

- Shares data at meetings and with the wider scientific community through SIV group publications and the OFFLU website
- Provides up-to-date expert scientific advice to OIE, FAO and WHO
- Advocates increased targeted surveillance and identifies priority areas for IAV surveillance in swine
- Identifies priorities for IAV research in swine
- Responds with urgent expert advice and risk assessment

Need for global influenza monitoring in swine Benefits to animal health

- Establish a baseline of the dominant SIV subtypes and lineages in different geographic regions to inform and measure success of control strategies
- Comparison of continents and regions, tracking of major changes in the epidemiology, and detection of novel and variant viruses in a timely manner
- Optimization of diagnostic techniques and assistance in the selection of IAV vaccine strains for pigs
- A better understanding of the antigenic and genetic evolution of IAV in swine over time
- Insight into epidemiology and modes of transmission
- Understanding human-to-swine transmission
- Understanding the significance of IAV in acute respiratory disease and in the porcine respiratory disease complex
- A collection of viruses for applied and fundamental experimental research and vaccine development

Benefits to public health

- Timely identification, characterization and reporting of emerging influenza viruses to inform diagnostic, antiviral and vaccine preparedness
- Data about the role of swine IAV as a zoonosis
- Identifying determinants of risk for the role of swine IAV in human influenza pandemic preparedness
- Bi-directional sharing of information between human and animal health sectors

Challenges to SIV surveillance globally

- Previous lack of coordinated efforts and networks for sharing
- Limited government infrastructure for non-reportable diseases like swine IAV
- Lack of reference labs with swine IAV expertise in some high-priority regions
- Large amount of genetic and antigenic diversity worldwide (Figure 1)
- Non-biased representative sampling is difficult
 - Producer and veterinary participation is voluntary
- Lack of financial and human resources requires prioritization of efforts (Figure 2)
- Determinants of risk to pigs and people are relatively unknown

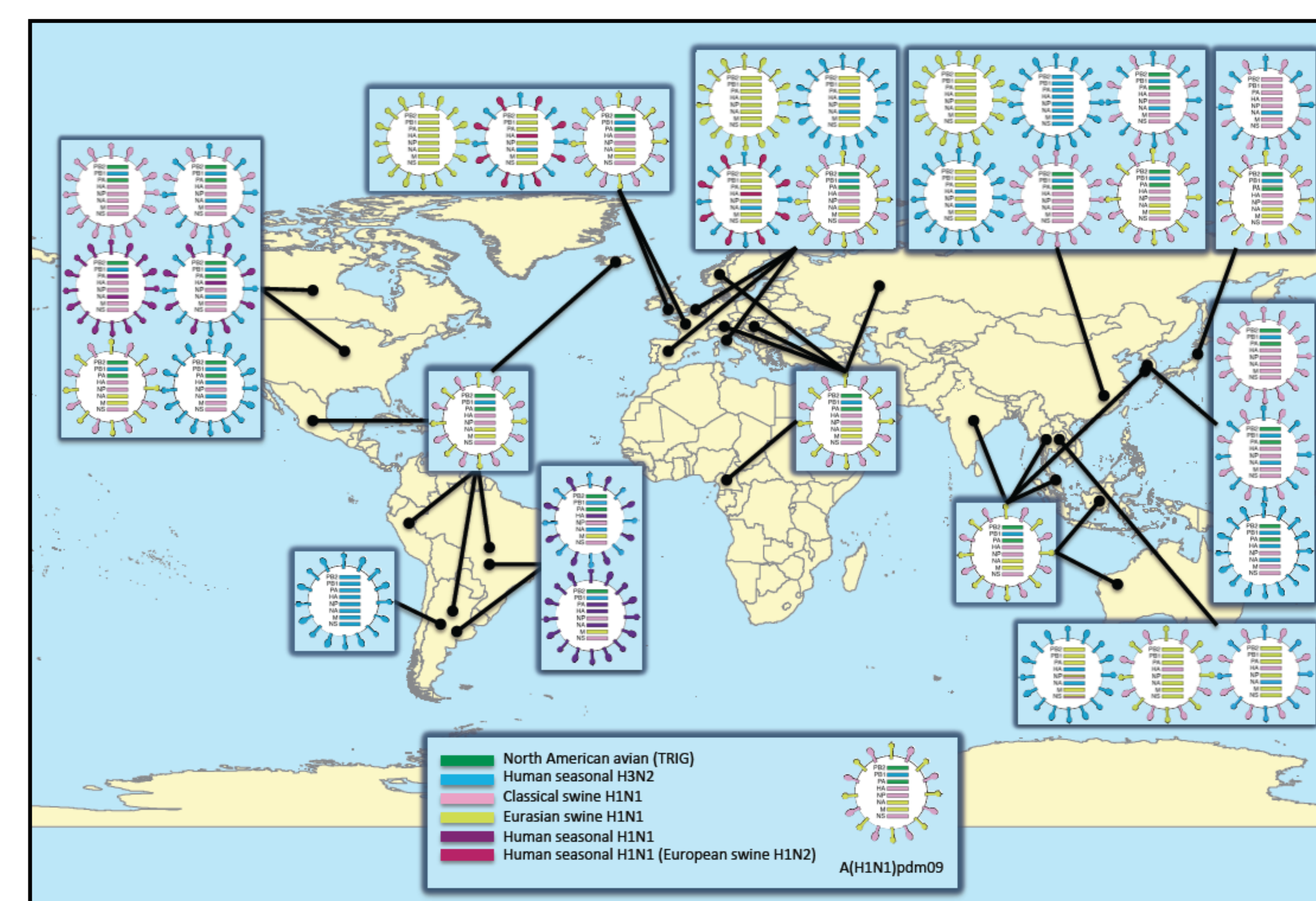
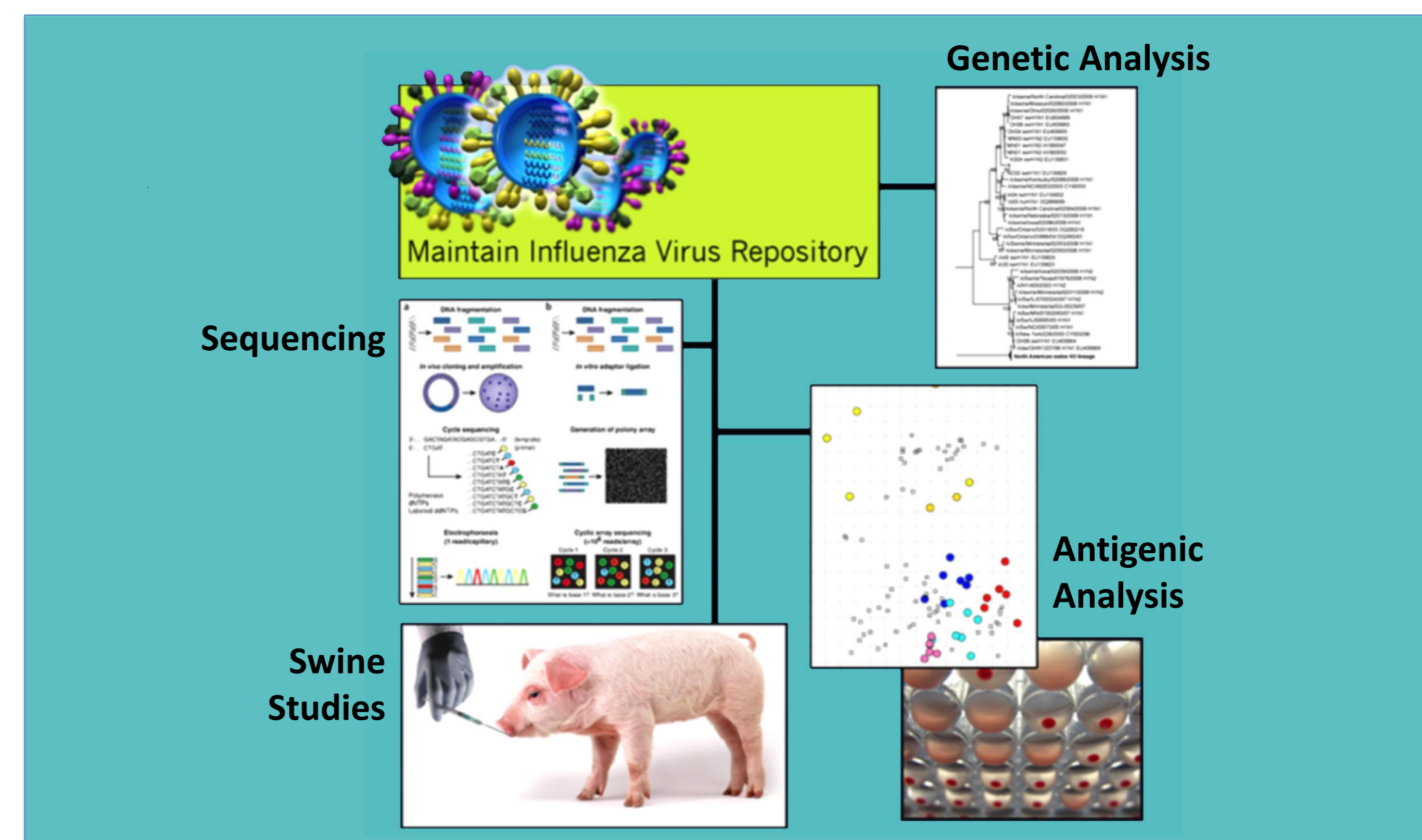


Figure 1. Predominant influenza A viruses (IAV) endemic in swine populations around the world in 2009-2010. Although all IAV established in swine populations are of the H1N1, H1N2, or H3N2 subtypes, multiple lineages and whole genome constellations distinguish viruses from different countries and regions. The major lineages include swine-adapted viruses of North America, Europe, Asia and human seasonal viruses that have spilled over into swine and become established including the H1N1pdm09.

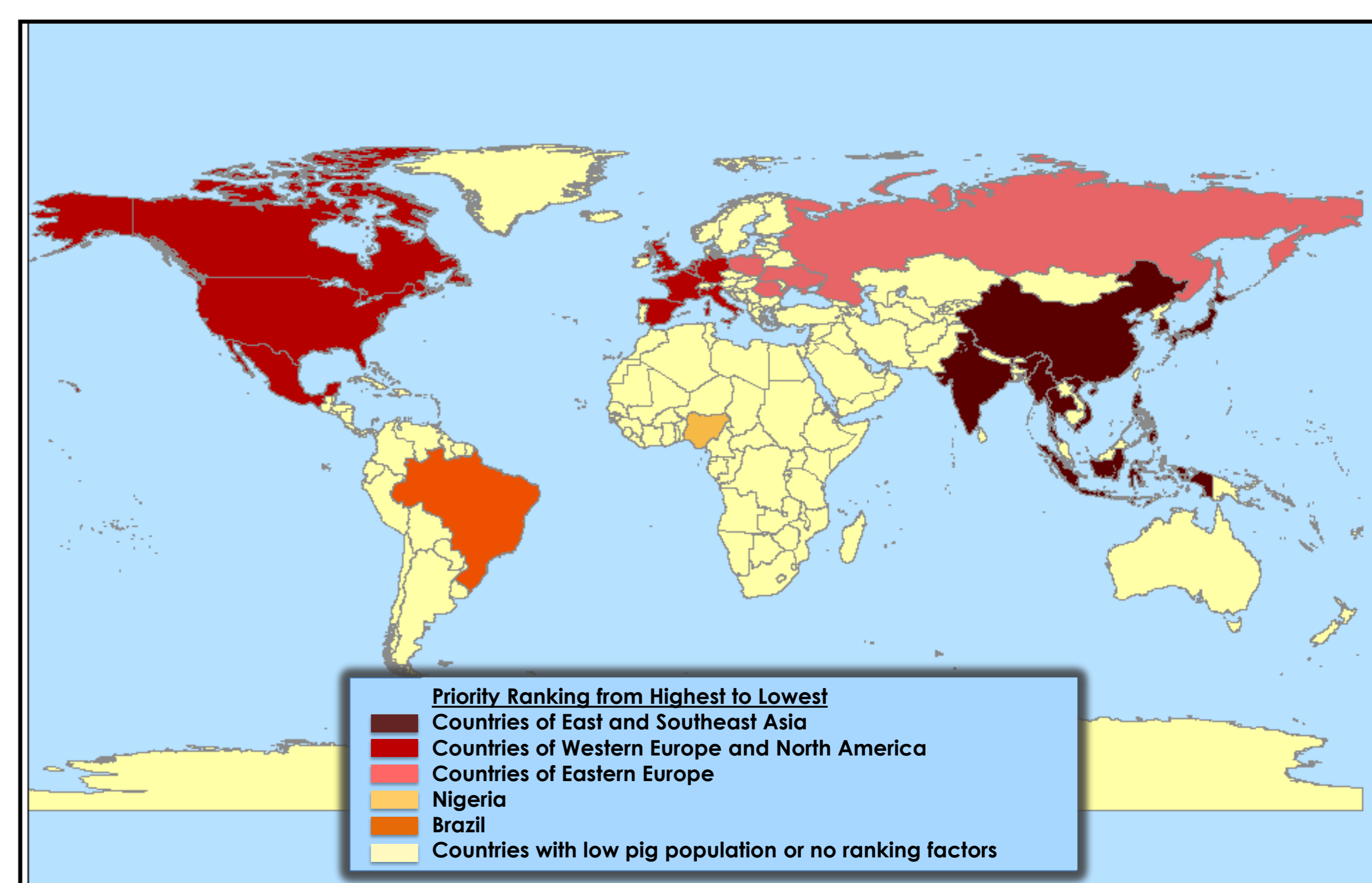


Figure 2. Countries with priority for targeted surveillance for influenza A virus (IAV) evolution or circulation in swine. Rankings were based on relative risk of spread and emergence of IAV in swine (high population numbers of pig, poultry, and waterfowl), risk factors for swine outbreaks, potential for reassortment between viruses circulating in pigs and birds due to husbandry methods, and/or continental and global spread through movement and export. This priority ranking does not imply that lower-ranked countries should not conduct IAV surveillance in swine, but emphasizes those regions that should receive priority focus.

Reference

OFFLU Swine Influenza Virus Technical Working Group. Review of Influenza A Virus in Swine Worldwide: A Call for Increased Surveillance and Research. *Zoonoses Public Health*. 2014 Feb;61(1):4-17

Producer and veterinary support and participation is vital.

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