

A) Influenza (updated 5th January 2010)

1- New pandemic A/H1N1 : experimental trials and phylogenetic investigations.

Journal of General Virology (2009), 90, 2119–2123

DOI 10.1099/vir.0.014480-0

Short Communication

Pathogenesis and transmission of the novel swine-origin influenza virus A/H1N1 after experimental infection of pigs

Elke Lange,¹ Donata Kalthoff,² Ulrike Blohm,¹ Jens P. Teifke,¹ Angele Breithaupt,¹ Christina Maresch,¹ Elke Starick,² Sasan Fereidouni,² Bernd Hoffmann,² Thomas C. Mettenleiter,³ Martin Beer² and Thomas W. Vahlenkamp¹

Correspondence

Thomas W. Vahlenkamp
thomas.vahlenkamp@fli.bund.de

¹Institute of Infectology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany

²Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany

³Institute of Molecular Biology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany

Influenza virus A/H1N1, which is currently causing a pandemic, contains gene segments with ancestors in the North American and Eurasian swine lineages. To get insights into virus replication dynamics, clinical symptoms and virus transmission in pigs, we infected animals intranasally with influenza virus A/Regensburg/D6/09/H1N1. Virus excretion in the inoculated pigs was detected in nasal swabs from 1 day post-infection (p.i.) onwards and the pigs developed generally mild symptoms, including fever, sneezing, nasal discharge and diarrhoea. Contact pigs became infected, shed virus and developed clinical symptoms similar to those in the inoculated animals. Plasma samples of all animals remained negative for virus RNA. Nucleoprotein- and haemagglutinin H1-specific antibodies could be detected by ELISA 7 days p.i. CD4⁺ T cells became activated immediately after infection and both CD4⁺ and CD8⁺ T-cell populations expanded from 3 to 7 days p.i., coinciding with clinical signs. Contact chickens remained uninfected, as judged by the absence of virus excretion, clinical signs and seroconversion.

Received 19 June 2009

Accepted 6 July 2009

Letters

INFLUENZA

Influenza A (H1N1) infection in pigs

Sharon M. Brookes¹, Richard M. Irvine¹, Alejandro Nunez¹, Derek Clifford¹, Steve Essen¹, Ian H. Brown¹, Kristien Van Reeth², Gaëlle Kuntz-Simon³, Willie Loeffen⁴, Emanuela Foni⁵, Lars Larsen⁶, Mikhail Matrosovich⁷, Michel Bublot⁸, Jaime Maldonado⁹, Martin Beer¹⁰ and Giovanni Cattoli¹¹

¹ Community Reference Laboratory for Avian Influenza and Newcastle Disease, VLA - Weybridge, New Haw, Addlestone, Surrey KT15 3NB

² University of Ghent, Salisburylaan 133, 9820 Merelbeke, Belgium

³ Agence Française de Sécurité Sanitaire des Aliments, LERAPP, Zoopôle Les Croix, BP 53, 22440 Ploufragan, France

⁴ Central Veterinary Institute, Lelystad, PO Box 65 8200 AB Lelystad, The Netherlands

⁵ Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, Sezione di Parma, Via dei Mercati 13 A, 43100 Parma, Italy

⁶ National Veterinary Institute, Technical University of Denmark, Bülowsvej 27, Building 11, Room 1.118, 1790 København V, Denmark

⁷ Institute of Virology, Philipps University, Hans-Meerwein-Strasse 2, 35043 Marburg, Germany

⁸ Merial, 29 Avenue Tony Garnier, 69007 Lyon, France

⁹ Laboratorios HIPRA, Avda. La Selva, 135, 17170 Amer Girona, Spain

¹⁰ Friedrich-Loeffler-Institute, Federal Research Institute for Animal Health, Südufer 10, 17493 Greifswald-Insel Riems, Germany

¹¹ Istituto Zooprofilattico Sperimentale Padova, Viale dell'Università 10, 35020 Legnaro, Padova, Italy

We wish to report the preliminary findings of an experimental study in pigs infected with a strain of the recently emerged influenza A (H1N1) virus associated with the current global epidemic in humans ([Irvine and Brown 2009](#)). The study is funded by the European Commission (DG SANCO) and Defra, and comprises a project consortium of nine institutes and organisations from eight EU member states, coordinated by the Mammalian Influenza Group, Veterinary Laboratories Agency (VLA) - Weybridge. The study aims include investigation of the infection dynamics, clinical outcome, pathogenesis, host susceptibility, immune response and transmissibility of influenza A (H1N1) virus infection in pigs.

The study design has involved six groups of pigs, aged four to five weeks at the start of the experiment, using an established infection and transmission model. One group of pigs (group A) (n=11) was infected (on May 15, 2009) by intranasal aerosol. Three uninfected pigs were maintained as a control group, and four pairs of naive, uninfected pigs were sequentially introduced with previously infected pigs for contact transmission at monitored intervals.

All of the pigs were subject to daily veterinary inspections, temperature and bodyweight measurements, and the collection of nasal, ocular, oral and rectal swab samples. Swab samples were then subject to testing by real-time RT-PCR methods. Blood samples were also collected daily from the infected pigs up to day 4 postinfection, and again at day 7, for assessment of viraemia, acute phase protein production and other haematological and immunological parameters. Blood sampling for serology and haematology was then performed twice weekly. Postmortem examinations were performed on two pigs from group A on day 1 (one pig only), and days 2, 3, 4 and 7 postinfection. A full range of tissue specimens was collected.

Results of our preliminary analyses of the clinical, pathological, shedding and transmission data from the first 14 days of the study have shown that pigs are susceptible to infection with influenza A (H1N1) virus, which results in the induction of detectable levels of clinical disease, virus shedding and respiratory tract pathology in an experimental setting. Furthermore, while variations in the range, pattern and severity of clinical signs and morbidity were observed between individuals and infected groups, these remained typical of influenza A infections in pigs.

Importantly, mortality was not a feature, and infected animals were able to transmit the virus to naive contact pigs successively for at least three cycles of transmission, suggesting the virus could become established in susceptible pig populations if introduced, with consequent impacts. To date, reverse zoonosis has been reported to have occurred naturally on one occasion in Canada ([OIE 2009](#)), and we have now demonstrated the potential for this phenomenon experimentally. It is also important to note that the observed levels of morbidity and mortality in a field setting may differ depending on a number of factors, including the age of the pig, immune status to endemic swine influenza viruses and, in particular, the role of other intercurrent disease and/or pig husbandry and management factors that could result in differing clinical and economic impacts to the pig industry.

A key aim of this study is the timely provision and dissemination of critical data relating to the outcomes of infection with this novel influenza A H1N1 virus in pigs to interested parties,

including veterinary surgeons, industry and other stakeholders, and to also provide a robust scientific evidence base to inform veterinary and public health risk assessments and decision makers. Further information and details relating to these preliminary analyses can be found on the VLA website: www.defra.gov.uk/vla/diseases/dis_si.htm

In addition, over the coming weeks and months further work and analyses relating to this study are planned, and will be conducted by all members of this EU study consortium. Updates will continue to be provided through a variety of media, including websites (European Commission, DG SANCO [http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/index_en.htm], VLA, Defra), and peer-reviewed and other publications.

References

IRVINE, R. M. & BROWN, I. H. (2009) Novel H1N1 influenza in people - worldwide spread from an animal source? *Veterinary Record* **164**,577 - 578[[Abstract/Free Full Text](#)]

OIE (2009) World Organisation for Animal Health, WAHID Weekly Disease Information. Vol 22, number 19, May 7, 2009. www.oie.int/wahis/public.php?page=weekly_report_index&admin=0. Accessed May 28, 2009

Research

Open Access

Panorama phylogenetic diversity and distribution of type A influenza viruses based on their six internal gene sequences

Ji-Ming Chen*¹, Ying-Xue Sun¹, Ji-Wang Chen², Shuo Liu¹, Jian-Min Yu¹, Chao-Jian Shen¹, Xiang-Dong Sun¹ and Dong Peng¹

Address: ¹The Laboratory of Animal Epidemiological Surveillance, China Animal Health & Epidemiology Center, Qingdao, PR China and ²The Feinberg School of Medicine, Northwestern University, Chicago, USA

Email: Ji-Ming Chen* - jmchen66@yahoo.cn; Ying-Xue Sun - sunyingx2004@sina.com; Ji-Wang Chen - jiwang@northwestern.edu; Shuo Liu - llushuo_z@hotmail.com; Jian-Min Yu - yu_jianmin16@live.cn; Chao-Jian Shen - shenchaojianyy@hotmail.com; Xiang-Dong Sun - sun_xiangdong@hotmail.com; Dong Peng - hobohero@hotmail.com

* Corresponding author

Published: 8 September 2009

Received: 6 August 2009

Virology Journal 2009, 6:137 doi:10.1186/1743-422X-6-137

Accepted: 8 September 2009

This article is available from: <http://www.virologyjournal.com/content/6/1/137>

© 2009 Chen et al; licensee BioMed Central Ltd.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Background: Type A influenza viruses are important pathogens of humans, birds, pigs, horses and some marine mammals. The viruses have evolved into multiple complicated subtypes, lineages and sublineages. Recently, the phylogenetic diversity of type A influenza viruses from a whole view has been described based on the viral external HA and NA gene sequences, but remains unclear in terms of their six internal genes (PB2, PB1, PA, NP, MP and NS).

Methods: In this report, 2798 representative sequences of the six viral internal genes were selected from GenBank using the web servers in NCBI Influenza Virus Resource. Then, the phylogenetic relationships among the representative sequences were calculated using the software tools MEGA 4.1 and RAxML 7.0.4. Lineages and sublineages were classified mainly according to topology of the phylogenetic trees and distribution of the viruses in hosts, regions and time.

Results: The panorama phylogenetic trees of the six internal genes of type A influenza viruses were constructed. Lineages and sublineages within the type based on the six internal genes were classified and designated by a tentative universal numerical nomenclature system. The diversity of influenza viruses circulating in different regions, periods, and hosts based on the panorama trees was analyzed.

Conclusion: This study presents the first whole views to the phylogenetic diversity and distribution of type A influenza viruses based on their six internal genes. It also proposes a tentative universal nomenclature system for the viral lineages and sublineages. These can be a candidate framework to generalize the history and explore the future of the viruses, and will facilitate future scientific communications on the phylogenetic diversity and evolution of the viruses. In addition, it provides a novel phylogenetic view (i.e. the whole view) to recognize the viruses including the origin of the pandemic A(H1N1) influenza viruses.

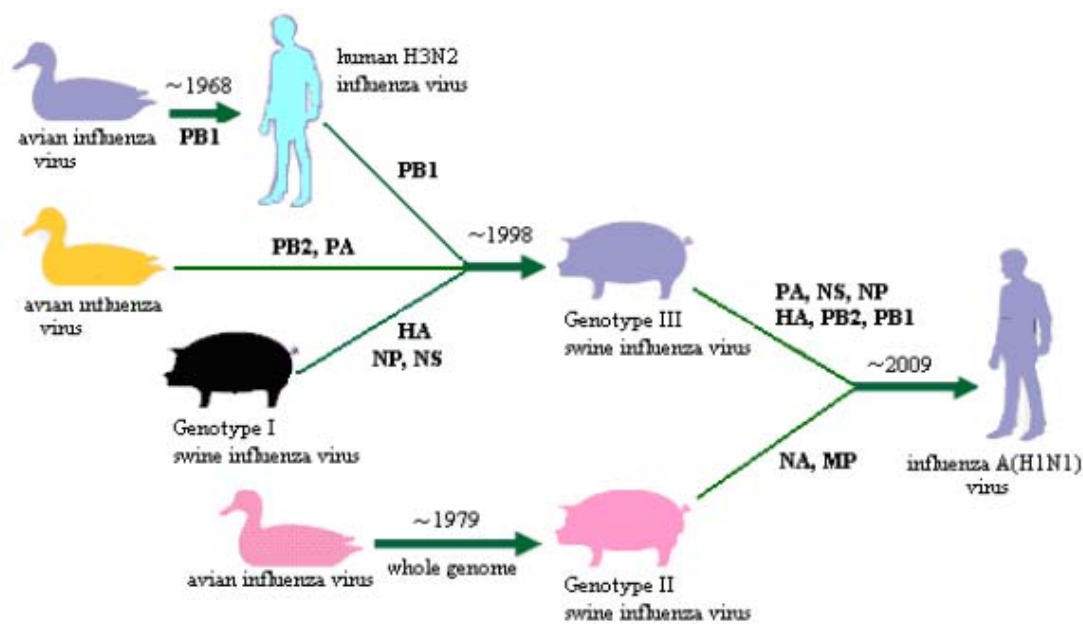


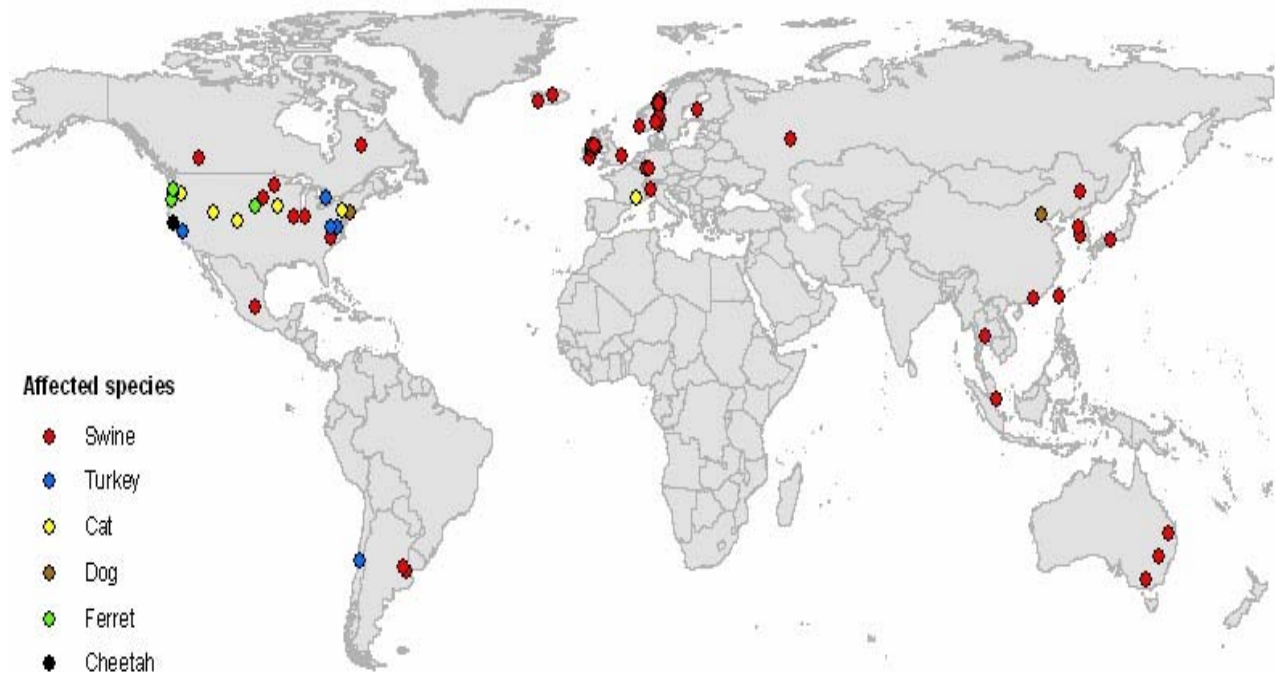
Figure 7
The putative evolutionary history of the eight genes of the new A(H1N1) virus.

2- FAO Animal-human interface

A) Pandemic H1N1 : situation in January 2010

Pandemic H1N1 2009 Situation in 2009 in animals

The situation in humans is widespread, with cases of pandemic H1N1 2009 causing mild disease in thousands of patients in the five continents. Infection with pandemic H1N1 2009 has been identified in six different animal species in 21 countries, mainly in pigs. Since the first detection of pandemic H1N1 2009 in pigs in April 2009, virus infection has been confirmed in commercial herds in Argentina, Australia, Canada, China, Finland, Germany, Iceland, Indonesia, Ireland, Italy, Japan, Mexico, Norway, Republic of Korea, Russian Federation, Singapore, Thailand, United Kingdom and USA. It seems that the virus causes only mild clinical signs. It appears to have been mostly introduced to pig herds by infected, virus-excreting humans, but spread to other swine holdings through movement of incubating, sick or virus shedding pigs is also possible. The mild symptoms would explain why it is mostly developed countries that have detected the infection through active surveillance programs and laboratory testing. Also to stress that none of these positive animals were backyard pigs, most likely because surveillance programs do not target these production settings. The other farm animal species that has been affected are turkeys, with outbreaks reported in Chile, Canada and USA. Clinical signs in turkeys are also very mild, only detectable because of a slight decrease in egg production.



Because of the close contact between people and their pets there are also a number of pet species that have been found positive to pandemic H1N1 2009, some of which have died. There have been affected ferrets in the USA, cats in the USA and France, and dogs in China and the USA. The last new affected species has been a cheetah (wild feline) in a zoo in California, USA. Considering that pandemic H1N1 2009 is not a notifiable disease, the OIE has given specific recommendations to countries that are detecting this virus in animals to report it as an emergent disease. However, once a first report is submitted, follow-up reports for additional outbreaks are not required. The genetic sequences of influenza virus isolates from many outbreaks of pandemic H1N1 2009 in animals have been compared with human strains of pandemic H1N1 2009 influenza occurring in the same locations. In all of the reported comparisons, there has been a strong genetic homology, demonstrating that the main route of infection of animals is from humans in close contact. The epidemiological data available from outbreaks indicate that animals play a negligible role in the spread of pandemic H1N1 2009 in humans.

Table 1. Countries and species affected by pandemic H1N1 2009

Country	Affected Species	Events (144)
Argentina	Swine	2
Australia	Swine	3
Canada	Swine	2
	Turkey	1
Chile	Turkey	2
China	Swine	4
	Dog	1
Finland	Swine	1
France	Cat	1
Germany	Swine	1
Iceland	Swine	2
Indonesia	Swine	1
Ireland	Swine	2
Italy	Swine	1
Japan	Swine	1
Mexico	Swine	1
Norway	Swine	72
Republic of Korea	Swine	17
Russian Federation	Swine	1
Singapore	Swine	1
Thailand	Swine	1
U.K.	Swine	5
U.S.A.	Swine	6
	Turkey	4
	Cat	7
	Dog	1
	Ferret	3

B) Some more details

Norway

Pandemic Influenza A/H1N1

The Veterinary Institute of Norway reported on 24 December 2009 that in the continuing outbreak, 79 swine farms have now been reported positive for pandemic H1N1 2009.

<http://www.vetinst.no/nor/Nyheter/Svineinfluensa-Status-24.-desember>

Republic of Korea

Pandemic Influenza A/H1N1

Pandemic H1N1 2009 has been confirmed in two pig farms, in Cholla, Bukdo Province and in Inch'on, Jikhalsi Province.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8810

USA

California

Pandemic Influenza A/H1N1

Dec 28, 2009 - The County of Los Angeles Department of Public Health and Pico Boulevard Pet Hospital have reported a 2009 H1N1-infected cat in southern California.

http://www.avma.org/public_health/influenza/new_virus/default.asp

Russia

Pandemic Influenza A/H1N1

Dec 24, 2009 – Pandemic Influenza A/H1N1 was reported among pigs in a swine farm in Cheboksarsky. The results were confirmed by gene sequencing, Real time Reverse Transcriptase/ Polymerase Chain Reaction and Virus Isolation.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8796

USA

North Carolina

Pandemic Influenza A/H1N1

Dec 23, 2009 - A federal laboratory has confirmed the presence of the novel H1N1 2009 influenza virus in samples taken from pigs at 2 North Carolina farms.

http://www.porkmag.com/directories.asp?pgID=675&ed_id=8636&component_id=805

EUROPE

Germany

Pandemic Influenza A/H1N1

Dec 10, 2009 - The German veterinary authorities sent an immediate notification to the OIE on 10 December on the outbreak that occurred in a swine farm in Rheinland-Pfalz.

http://www.oie.int/wahis/public.php?page=weekly_report_index&admin=0

USA

Oregon

Pandemic Influenza A/H1N1

Dec 10, 2009 - A second cat in Oregon has died after becoming infected with the H1N1 pandemic flu virus..

<http://www.petpeoplesplace.com/resources/news/cats/second-cat-dies-from-swine-flu.htm>

Colorado

Pandemic Influenza A/H1N1

Dec 04, 2009 - Two cats from different households in Colorado have tested positive for H1N1, according to Colorado State University's Veterinary Diagnostic Laboratory.

<http://www.news.colostate.edu/Release/4934>

Italy

Pandemic Influenza A/H1N1

Dec 04, 2009 – An outbreak of pandemic H1N1 has been reported in a swine farm with a morbidity rate of 30 in Nerviano, Milano, Lombardia.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8728

UK

Pandemic Influenza A/H1N1

Dec 02, 2009 - A sixth case of pandemic H1N1 2009 influenza virus has been confirmed in the UK in pigs in a farm in Norfolk.

<http://www.defra.gov.uk/news/2009/091202a.htm>

USA

Virginia

Pandemic Influenza A/H1N1

Dec 02, 2009 - The pandemic H1N1 flu virus was confirmed in a flock of breeder turkeys in Virginia - the 1st US case involving turkeys, the US Agriculture Department said on Monday, 30 Nov 2009.

<http://www.reuters.com/article/idUSTRE5AT5P720091130>

Finland

Pandemic Influenza A/H1N1

Nov 30, 2009 – An outbreak of pandemic H1N1 2009 influenza virus has been confirmed in a swine farm in Teuva, Lansi-Suomi.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8707

ASIA

Chinese Taipei Influenza A/H1N1

Nov 06, 2009 – Influenza A/H1N1 has been detected among 5 week old piglets in a swine farm in Guanshan Township, T'ai Tung.

http://www.oie.int/wahis/public.php?page=weekly_report_index&admin=0

Indiana

Influenza A/H1N1

The U.S. Department of Agriculture says pigs in a commercial herd in Indiana have tested positive for the H1N1 flu virus during one of its swine surveillance programs.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8613

http://www.twincities.com/ci_13712025?nclick_check=1

Iowa

Influenza A/H1N1

Nov 03, 2009 – A cat in Iowa has tested positive for H1N1, the first time a cat has been diagnosed with the new pandemic strain, the American Veterinary Medical Association said on Monday.

<http://www.reuters.com/article/GCA-SwineFlu/idUSTRE5A33ZG20091104>

Ontario

Influenza A/H1N1

Canadian Food Inspection Agency has reported an outbreak of H1N1 Influenza among turkeys in a farm in Waterloo-Wellington County.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8578

Iceland

Influenza A/H1N1

Oct 27, 2009 – Ministry of Agriculture, Selfoss has reported an outbreak of Influenza H1N1 in a pig farm in Vogar, Gullbringu. Two workers had flu like symptoms two days prior to the development of clinical sign in pigs.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8594

Japan

Influenza A/H1N1

Oct 21, 2009 – Pandemic Influenza H1N1 was confirmed in a pig farm during the surveillance conducted by the prefectural veterinary authority. Epidemiological investigations are continuing.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8554

AUSTRALIA

Influenza/ H1N1

Oct 14, 2009 - A piggery near Toowoomba has been placed under quarantine after test results came back positive for INFLUENZA/H1N1.

<http://www.theaustralian.news.com.au/story/0,,26209865-5006786,00.html>

Norway

Influenza A/H1N1 Virus

Oct 13, 2009 - The Norwegian veterinary authorities have reported a new outbreak of the A/H1N1 virus in swine. The infection seems to have been introduced from humans to the pigs in the farrowing unit.

http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=8515

Ireland

Influenza A/H1N1

Sep 29, 2009 – Pandemic influenza A/H1N1 outbreak has been reported in a swine farm in Kilworth, Cork in Ireland. Of the 3050 pigs in the farm, 40 were infected. One of the workers of the farm was confirmed as source of the infection the previous week.

http://www.oie.int/wahis/public.php?page=weekly_report_index&admin=0

United Kingdom

Influenza A/H1N1

Sep 18, 2009 – H1N1 has been reported in a pig farm in Northern Ireland, with a morbidity rate of 90 and 0.1 percent mortality. The source of infection is unknown.

http://www.oie.int/wahis/public.php?page=weekly_report_index&admin=0

Singapore

Influenza A/H1N1

03 Sep, 2009 - The Agri-Food and Veterinary Authority (AVA) has detected the pandemic A (H1N1) virus in some pigs imported into Singapore from Indonesia's Pulau Bulan.

<http://www.channelnewsasia.com/stories/singaporelocalnews/view/1002648/1/.html>

Chile

Influenza A/H1N1

August 21, 2009 – Swine flu virus has been isolated among turkeys in two private farms in Chile. The virus was detected after the egg production dropped drastically. This is for the first time it is proved that this new virus can be transmitted from humans to birds.

http://www.oie.int/wahis/reports/en_imm_0000008389_20090821_200818.pdf

AUSTRALIA

Influenza A/H1N1

July 31, 2009 - Tests have confirmed that swine flu has broken out at a piggery in the central west of New South Wales. It is the first case of the virus among pigs in Australia and the State Government believes the animals probably caught the disease from workers at the piggery;
<http://www.abc.net.au/news/stories/2009/07/31/2642757.htm>

Influenza A/H1N1

July 28, 2009 - An isolated case of the pandemic strain of H1N1 influenza has been confirmed in a Quebec hog herd that has since "completely recovered." The Provincial Agriculture, Food and Fisheries Ministry (MAPAQ) said in a release Tuesday that the strain had been identified Friday at the labs of the National Centre for Foreign Animal Disease in Winnipeg.
<http://www.albertafarmexpress.ca/issues/ISArticle.asp?aid=1000335999&PC=FBC&issue=07282009>

Argentina declares health emergency, flu found in pigs

July 17, 2009 - The government declared a nationwide animal health emergency following the discovery of the new H1N1 flu virus in at least one pig herd. The flu strain has killed 137 people in the South American country during the Southern Hemisphere winter and the government has closed schools and urged Argentines to avoid crowded places to halt its spread.
<http://www.buenosairesherald.com/BreakingNews/View/6666>

Changes in reporting requirements for pandemic (H1N1) 2009 virus infection

July 16, 2009 - As the 2009 pandemic evolves, the data needed for risk assessment, both within affected countries and at the global level, are also changing. Countries should change the way they track the spread of swine flu, said WHO, noting that it no longer serves any useful purpose to count individual confirmed cases. Instead the WHO asked countries to look for signs of "unusual events", indicators that might suggest alterations in patterns of disease severity or spread that might be signs of changes in the pandemic virus.
http://www.who.int/csr/disease/swineflu/notes/h1n1_surveillance_20090710/en/index.html

Pandemic (H1N1) 2009: the OIE re-emphasizes its recommendations to animal health authorities worldwide

July 13, 2009 - The pandemic H1N1 2009 virus continues to spread among humans worldwide currently causing mild symptoms in the majority of cases; however, there is no evidence at this time that animals are playing any role in the epidemiology or the spread of the virus. While the virus continues to spread among humans worldwide, the role of animals has not yet been demonstrated in the epidemiology or spread of the pandemic H1N1 2009.
http://www.oie.int/eng/press/en_090713.htm

Swine flu origins revealed

June 30, 2009 - A new analysis of the current swine-origin H1N1 influenza A virus suggests that transmission to humans occurred several months before recognition of the existing outbreak. The work, published online in Nature June 10, highlights the need for systematic surveillance of influenza in swine, and provides evidence that new genetic elements in swine can result in the emergence of viruses with pandemic potential in humans.
<http://www.vetscite.org/publish/items/005292/index.html>

Patchy pig monitoring may hide flu threat

June 30, 2009 - Egypt has seen mass culling of pigs. Public-health experts are warning that a lack of surveillance may be allowing the 2009 pandemic H1N1 flu virus to go undetected in pigs. This raises the risk that the virus could circulate freely between humans and pigs, making it more likely to reassort into a deadlier strain, they say.

<http://www.vetscite.org/publish/items/005291/index.html>

Swine flu transmission studies suggest new virus is here to stay: experts

July 2, 2009 - Swine flu viruses are missing at least two key features seen in all flu viruses present and past that transmit well among people and yet the viruses are spreading quite efficiently, two new studies suggest. The research groups which produced the work differ slightly in their views of the degree to which the novel H1N1 virus is spreading, with one finding transmission isn't yet as efficient as with human flu viruses while the other finding transmission rates are in lockstep with those of seasonal flu cousins.

http://chealth.canoe.ca/channel_health_news_details.asp?news_id=28420&news_channel_id=1020&channel_id=1020

Joint FAO/WHO/OIE Statement on influenza A(H1N1) and the safety of pork

May 7, 2009 - To avoid any misunderstanding FAO, WHO and OIE would like to reissue their joint statement originally issued on 30 April. In the ongoing spread of influenza A(H1N1), concerns about the possibility of this virus being found in pigs and the safety of pork and pork products have been raised.

Influenza viruses are not known to be transmissible to people through eating processed pork or other food products derived from pigs. Heat treatments commonly used in cooking meat (e.g. 70°C/160°F core temperature) will readily inactivate any viruses potentially present in raw meat products. Pork and pork products, handled in accordance with good hygienic practices recommended by the WHO, Codex Alimentarius Commission and the OIE, will not be a source of infection. Authorities and consumers should ensure that meat from sick pigs or pigs found dead are not processed or used for human consumption under any circumstances.

http://www.oie.int/eng/press/en_090507_bis.htm

FAO urges countries to closely monitor H1N1 in pigs

May 4, 2009 - After the detection of the A/H1N1 virus in pigs in Canada transmitted by a human, FAO has again urged national authorities and farmers to carefully monitor pigs and investigate any possible occurrences of influenza-like symptoms in domestic animals. The human-to-animal transmission that occurred in Canada does not come as a surprise as influenza viruses are capable of transmitting from humans to animals," FAO's Chief Veterinary Officer Joseph Domenech said. Influenza viruses, whether in humans or among animals, are constantly evolving genetically, along with changes in their ability to cause morbidity and mortality in humans or animals. Therefore the current A/H1N1 situation should be carefully monitored as many of the virus characteristics and developments are still unknown, Domenech said. Strict biosecurity measures including restriction of movements of pigs, goods and people should be applied on all farms or holdings with swine showing signs of clinical respiratory illness until diagnosis of the illness has been made. Where A/H1N1 influenza is confirmed, movement restrictions should be in force for seven days after the last animal has recovered. Governments are requested to provide full support in improving biosecurity measures particularly to small and medium pig farmers.

<http://www.fao.org/news/story/en/item/19365/icode/>