

# Swine-origin triple reassortant influenza A(H3N2) viruses in North America

Update – 13 December 2011

## Conclusions and recommendations

- Another case of infection with triple reassortant swine influenza SOIVtrA(H3N2)-M has been reported in humans in the US bringing the total of such cases to 11;
- While human-to-human transmission has probably taken place in the US there are no expanding clusters of infections;
- The EU National Influenza Centres are in the midst of strengthening their capacity to detect this new virus which is not thought to be present in pigs in Europe;
- The conclusions and recommendations of the ECDC Rapid Risk Assessment of 29 November remain valid.

## SOURCE AND DATE OF REQUEST

Original request from the Directorate-General for Health and Consumers, supported by Member States at the EU Health Security Committee, 24 November 2011.

## PUBLIC HEALTH ISSUE

Implication for Europe of recent human infection and limited probable human-to-human transmission in the United States with triple reassortant<sup>i</sup> swine-origin influenza SOIVtrA(H3N2) viruses with a unique gene segment combination including the M gene from the 2009 A(H1N1)<sup>ii</sup> pandemic viruses.

The objective of this rapid risk assessment is to update the rapid risk assessment of 29 November 2011, with a focus on the epidemiological information and a report on progress made to address the diagnostic needs in the European Union that will enable detection of these new viruses.

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<sup>i</sup> Reassortment means the mixing of the genetic material of two or more virus species into new combinations, usually following co-infection of a host animal or human.

<sup>ii</sup> The influenza viruses that caused the 2009 pandemic are now designated A(H1N1)pdm09 (<http://www.who.int/wer/2011/wer8643.pdf>). However, since these are now seasonal viruses and no other human adapted A(H1N1) viruses have been found in the last Northern and Southern seasons in this risk assessment they will generally be referred to as A(H1N1) in text for brevity. Swine influenza viruses are generally designated as SO to indicate swine origin.

## CONSULTED EXPERTS

Internal ECDC experts.

## DISEASE BACKGROUND INFORMATION

Please refer to the Rapid Risk Assessment from [29 November 2011](#) for detailed disease background information.

## EVENT BACKGROUND INFORMATION

In the United States, nineteen human infections with swine-origin triple reassortant (SOtr) influenza A(H3N2) viruses have been identified since 2009.

Of these, 11 have been reported during 2011 and all of these were infections with SOIVtrH3N2 viruses containing the matrix (M) gene from the pandemic 2009 influenza A(H1N1) virus, now known as A(H1N1)pdm09. In this document these are called SOIVtrA(H3N2)-M viruses.

As of 9 December, the US CDC has reported the infection in humans in five states: Indiana (two cases), Iowa (three), Maine (two), Pennsylvania (three) and West Virginia (one). This is one more case and one more state than reported in the previous rapid risk assessment. The most recent case, from West Virginia, was reported in a child in December 2011 [1, 2].

Seven of the 11 cases of swine-origin influenza A(H3N2) reported in 2011 have resulted in mild illness and four have been hospitalised for influenza. All eleven patients have recovered [3]. In the first seven cases reported during 2011, exposure to swine was identified for the patient or a close contact of the patient. However, for the three cases reported in November from Iowa and the last reported case in December from West Virginia, there is no clear known exposure to swine populations. This, as well as the lack of clear epidemiological links, suggests that limited person-to-person transmission of this novel influenza virus has probably occurred [3].

Transmission to humans of swine-origin influenza A(H3N2) viruses not containing the M gene from the A(H1N1)pdm09 virus through close contact with an infected person has been previously reported but has not resulted in sustained person-to-person transmission. Preliminary evidence from the investigation of these cases in Iowa shows no evidence of ongoing transmission among humans. Swine influenza viruses are spread from pig to pig but are not known to spread through human contact with pork or pork products.

## ECDC THREAT ASSESSMENT FOR THE EU

In the context of the swine-origin triple reassortant A(H3N2) viruses, since November 2010 ECDC has been collaborating with the Community Network of Reference Laboratories (CNRL) for Human Influenza in Europe and the WHO Collaborating Centre specifically to address the diagnostic aspects of these viruses. This year, the capability of European influenza reference laboratories to detect swine-origin triple reassortant viruses has been assessed. It was shown that there is good capacity to detect SOIVtrH3N2-M viruses as influenza A viruses but with restricted capability to subtype these viruses. Therefore it is important that all these viruses should be sent to the WHO Collaborating Centre in London.

Diagnostic RT-PCR for generic influenza A virus (targeted to the M-gene) will detect swine-origin triple reassortant A(H3N2) viruses as human influenza A. However, the subtype-specific RT-PCR for either H3 or N2 of human influenza A viruses will most probably have a decreased sensitivity or will result in no detection of the SO-A(H3N2) viruses. Probes directed against other genes, e.g. the nucleoprotein gene as was used during the early phase of the 2009 pandemic caused by the A(H1N1)pdm09 virus, will enable preliminary differentiation between human seasonal H3N2 viruses and these zoonotic H3N2 viruses. Therefore, swine-origin specific subtype RT-PCR, antigenic characterisation, and partial or full genome sequencing are the most appropriate techniques to distinguish between the human and these new zoonotic-origin influenza viruses.

The European influenza reference laboratories (National Influenza Centres or NICs) are aware of the detection challenges and a number are updating their detection protocols to be able to make this distinction. Additionally, a survey has been distributed to all remaining influenza reference laboratories in EU/EEA countries to understand the existing strategies for detection of these viruses across national laboratories. Results of this survey are under analysis. In addition a simple on-line survey is being undertaken to determine if and how NICs can detect the newer virus with its M-gene from A(H1N1)pdm09.

Should an unusual influenza virus be identified from a human in an EU or EEA country and be reported to ECDC it would be included in the [Weekly Influenza Surveillance Overview](#) in the virology section. To date, none of these

swine-origin triple reassortant viruses have been detected in pigs in Europe, despite weak veterinary surveillance for influenza throughout the EU.

With respect to the newly identified case of SOIVtrA(H3N2)-M in West Virginia, this is not unexpected given that these infections are endemic in pigs and surveillance for these viruses in humans has been enhanced in the US. The risk would be considered to have increased only in the event of well established and expanding clusters of these human infections, where ongoing chains of person-to-person transmission could not be excluded.

## CONCLUSIONS

The appearance of a new case in the US does not change the conclusions of the previous rapid risk assessment as there is currently no sign of any expanding cluster of cases in the US.

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## References

1. Limited Human to Human Transmission of Novel influenza A(H3N2) Virus – Iowa, November 2011, *CDC Morbidity and Mortality Weekly Report*, December 2, 2011 / 60(47);1615-1617.
2. US CDC Update: Influenza Activity — United States, October 2–November 26, 2011  
[http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6048a2.htm?s\\_cid=mm6048a2\\_e%0d%0a](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6048a2.htm?s_cid=mm6048a2_e%0d%0a)
3. US CDC: Have you heard CDC December 9<sup>th</sup>. CDC confirms two human infections with novel influenza viruses.  
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