



Highly Pathogenic Avian influenza in Republic of Kazakhstan

We report here emerging results of analyses of highly pathogenic avian influenza (HPAI) H5N8 viruses in the north of the Republic of Kazakhstan. Recently HPAI viruses of the H5N8 subtype have caused outbreaks in the Russia Federation in July and in the Republic of Kazakhstan since September. Viruses detected in domestic ducks, geese, chickens and a single mute swan in the Republic of Kazakhstan in September 2020 were of the A/H5N8 subtype and had a multi-basic cleavage site motif consistent with a highly pathogenic phenotype in galliform birds (PLREKRRKGLF) and belong to A/H5 GsGd clade 2.3.4.4b. For all gene segments the Kazakhstan viruses cluster together in phylogenetic trees, with the closest genetic relatives for a putative ancestral strain last detected in ~2017/2018. However long branch lengths from these putative ancestral relatives for each gene to current outbreak strains suggest undetected maintenance of Kazakhstan-like viruses as a complete genotype from emergence likely in early 2018 through to detection in September 2020. No subsequent information on the detection, circulation or spread of this emergent H5N8 virus is currently available, prior to the detection of the viruses in Kazakhstan. The viruses can be clearly distinguished in all gene segments from those of H5N8 viruses that caused widespread outbreaks in Europe during the first half of 2020. The phylogenetic tree topology, the lack of evidence for reassortment with LPAI gene segments from either domestic or wild anseriforms, the relatively short branch lengths within the Republic of Kazakhstan cluster linked by a long branch to ancestral strains suggests a) a very similar virus is responsible for all outbreaks in Kazakhstan, and b) long-term and under-surveilled but continued circulation is more likely to have occurred in galliform poultry in unknown regions/locations. The threat of this virus to the poultry sector through winter 2020/21 remains, along with the potential for re-spill over and diffusion mediated by wild birds and risk mitigation proportional to previous years is required. This work was done through close collaboration between the AI International Reference Laboratory, APHA-Weybridge, and Royal Veterinary College UK, and Kazakh Scientific Research Veterinary Institute, Almaty and the National Veterinary Reference Centre, Nur-Sultan, Republic of Kazakhstan.