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## Avian influenza XXIX



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## The use of avian influenza vaccines in the field

The global use of avian H5 and H7 influenza vaccines remained quite low until the mid-1990s and then grew quite quickly in the early 21st Century. For example, in 2002 there were only two manufacturers in OIE countries producing such vaccines and by 2007 that number had risen to 38 according to surveys.

By 2012 only 27 manufacturers were recognised who produced H5 and H7 vaccines. Little is known about vaccines for other H types even though vaccines against LPAI H9N2 seed strains are routinely used for commercial vaccines that are used in 10 countries across the Middle East and Asia.

Historically, using the USA as an example, AI vaccines were little used except for the control and eradication of problems related to LPAIs in defined high risk areas. A good example of such use is where vaccination was used to control outbreaks of LPAI that came from the wild duck population. However, outdoor production was a key factor in these outbreaks and when this ceased in 1997 the need to use LPAI vaccines was eliminated.

A low number of doses of vaccine (approximately two million) were subsequently in Utah to eradicate an outbreak of H7N3 LPAI.

Over 200 million doses – mainly inactivated H7 vaccine – were used between late 2002 and the end of 2006 in an emergency vaccination programme against H7.

Routine vaccination is unusual but an example of where routine vaccination was employed – again in the USA – was a situation where swine influenza virus crossed over from an infected pig unit to turkeys on a nearby farm and caused problems.

Probably the most extensive use of avian influenza vaccines has been the use of inactivated H9N2 vaccines to contain/control LPAI in the Middle East, where literally billions of doses have been used over the last two decades.

In Mexico the use of avian influenza vaccines started in 1995 during an epidemic of H5N2 HPAI. The HPAI form of the disease was quickly eradicated, but the LPAI H5N2 continues to circulate causing problems. To date, inactivated vaccine and rFPV-H5 vector vaccine have been used.

In Pakistan inactivated H7N3 vaccine started in 1995. Vaccination against H9N2 was actioned in 1998. Then, in 2006, with outbreaks of H5N1 Pakistan started using a trivalent inactivated vaccine containing H5, H7 and H9 subtypes.

H5 vaccination started in Hong Kong in 2002 and then in Indonesia in 2003 and China in 2004, followed by Vietnam in 2005 and then Côte d'Ivoire, Egypt, Israel, Kazakhstan, Mongolia, Pakistan and Russia in 2006 and some time later in 2012 in Bangladesh. Small amounts of vaccine were used in several other countries, often for protecting valuable or endangered birds. During this period, by far the greatest usage of vaccine was in China. With the exceptions of Honk Kong, China, Egypt Vietnam, Pakistan, most of these countries have now ceased vaccination.