Flu lab supports high-tech innovation and skills to tackle avian influenza in Pakistan

Reducing the risk to livestock and people. For more about ZELS: bbsrc.ukri.org/zels
Millions of stronger, more effective vaccines against avian influenza (‘bird flu’) are being developed and delivered by local vaccine producers in Pakistan as a result of ZELS research data from work undertaken in a new state-of-the-art avian flu laboratory.

The vaccines are having a direct impact in reducing massive economic losses from avian influenza - as well as reducing the major risk to public health that the disease poses. The H9N2 avian influenza virus (AIV) has been endemic in Pakistan since 1998, inflicting direct annual losses of over US$50m and indirect losses of over US$80m to the country’s poultry sector - and presenting the real risk of zoonotic transfer to people.

For pathogens such as AIVs to be controlled and eradicated, up-to-date knowledge needs to be available, as well as high-quality technologies. The ZELS project Combating bird flu by developing new diagnostic tools and vaccines facilitated the opening of a new, high-tech laboratory at University of Veterinary and Animal Sciences (UVAS) in Lahore, enabling important research work in improving AIV disease control systems in Pakistan.

Critical tools and equipment, including PCR machines, fridges and freezers, biosafety cabinets, incubators, pipettes, tube racks and reagents were supplied, and the laboratory was officially opened in 2014. This was followed by training local veterinarians for their Masters degrees.

The laboratory increased Pakistan’s capacity to identify virus strains causing disease outbreaks, to analyse the potency and efficacy of vaccines against locally prevalent viruses, and to increase awareness about the availability of new disease control tools, including novel vaccines and diagnostics developed at The Pirbright Institute, also through ZELS.

Between 2014 and 2017, over 3,600 samples from farmed poultry were collected, from which over 200 pathogens were isolated, including H9N2 AIVs, which were then analysed.

The data showed that multiple variants of H9N2 viruses were causing disease outbreaks and new vaccines should target multiple strains to provide effective protection. The strain selection and vaccine efficacy data from the project was shared with poultry vaccine producers, including two local companies linked with the project which produce around 8 million H9N2 vaccine doses per year, some 10% of Pakistan’s total demand.

As well as the immediate and direct impact on the disease through vaccine and diagnostic development, the research laboratory will continue to facilitate the training of postgraduates, as well as to train and disseminate good biosecurity practices to students and poultry industry stakeholders. Several of the lab’s first cohort of Masters students are also now continuing their research interests by undertaking PhDs.