Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Guest Editorial

Schmallenberg virus: Responding to the challenge

Detecting novel, exotic or re-emerging diseases is perhaps the most important reason for collaboration between state veterinary and public health services, and requires a holistic approach to preventing epidemic or epizootic disease and maintaining ecosystem integrity for the benefit of humans, livestock and biodiversity. The challenges posed by the outbreaks of BSE, severe acute respiratory syndrome (SARS), HIV, Ebola and Hendra virus, pandemic H1N1 influenza and highly pathogenic avian influenza H5N1, illustrate the importance of ongoing animal and human health surveillance. We need to maintain this surveillance not just locally but also globally if new threats are to be detected quickly and their spread limited. The ‘unknown unknowns’ out there, such as the recently identified Schmallenberg virus (SBV), perhaps present the greatest challenge, requiring a system that can identify truly unusual events and then respond with appropriate investigation and action.

The key to effective surveillance is the application of high-quality pathological and epidemiological investigative systems, allied with cutting-edge immunological and pathogen-detection techniques. Subsequent threat characterisation and risk assessment are also central to facilitating a sufficient, proportionate response. In this issue of The Veterinary Journal, Dr. Rachael Tarlinton and colleagues at The Nottingham School of Veterinary Medicine and Science, provide a timely and comprehensive review of the available science that informs the threat posed by the emergence of SBV to UK and mainland European livestock (Tarlinton et al., 2012). Their paper highlights a number of issues and challenges that merit discussion and comment.

The detection of and response to the SBV outbreak has underlined the benefits of robust surveillance to identify changes in trends, unusual clinical presentations and to consider where a diagnosis cannot be reached. This approach requires supportive effective analysis, as well as communication and ‘escalation’ routes to share information. The EU response to SBV has highlighted the benefits of working collaboratively: the speed and openness with which knowledge was shared by Germany and The Netherlands enabled the Animal Health and Veterinary Laboratories Agency (AHVLA), working with the Scottish Agricultural Colleges (SAC), in the UK to raise awareness of the spreading infection, identify suspect cases and confirm the disease. This collaboration is continuing through knowledge-sharing coordinated through the European Food Safety Authority (EFSA), and through joint EU and nationally funded research projects, drawing together a wealth of scientific knowledge and resources to target knowledge gaps. This approach will develop our shared understanding of SBV and provide reliable evidence to assure our trading partners as perhaps the greatest financial consequence of this disease is the negative impact of disproportionate trade restrictions.

It is often suggested that climate change is responsible for the emergence of new diseases in Europe such as SBV and bluetongue virus infection. However, there are also equally important links to both the indirect effects of climate (e.g. social and economic) and ‘non-climate’ (livestock type and density) changes. Factors such as international transport are likely to have increased the frequency with which vector-borne diseases are introduced to areas beyond their previously recognised distribution. Our intention is to research further the risk pathways and vulnerabilities that enable these new infections to arise as threats to UK livestock. Our experience in the UK, supported by EFSA’s recent report which collates SBV data from all affected EU member states, is that SBV is a ‘low impact’ disease affecting only 0.3% of all ruminant livestock premises across affected EU Member States (based on data as of 25th July 2012), a prevalence that we believe does not justify such rigorous trade and other restrictions.

Whilst safe effective vaccines are under development, the cost to the livestock industry of vaccination against such a low impact disease is relatively high when the low per-animal profit margins in sectors such as sheep farming are considered. Good data on disease distribution and impact are important to enable farmers to make sound economic decisions based on their particular circumstances. Working in partnership internationally and locally improves our disease vigilance in a constantly changing environment and is paramount to the function of disease early-warning systems. Disease outbreaks such as SBV infection are a global issue and disease reporting through the OIE, WHO and FAO mechanisms improve our disease vigilance in a constantly changing environment and is paramount to the function of disease early-warning systems. Disease outbreaks such as SBV infection are a global issue and disease reporting through the OIE, WHO and FAO mechanisms improve the benefits of working collaboratively: the speed and openness with which knowledge was shared by Germany and The Netherlands enabled the Animal Health and Veterinary Laboratories Agency (AHVLA), working with the Scottish Agricultural Colleges (SAC), in the UK to raise awareness of the spreading infection, identify suspect cases and confirm the disease. This collaboration is continuing through knowledge-sharing coordinated through the European Food Safety Authority (EFSA), and through joint EU and nationally funded research projects, drawing together a wealth of scientific knowledge and resources to target knowledge gaps. This approach will develop our shared understanding of SBV and provide reliable evidence to assure our trading partners as perhaps the greatest financial consequence of this disease is the negative impact of disproportionate trade restrictions.

The level of surveillance carried out in different countries should be proportionate to the risk of the disease occurring in that country, so that the probability of detection is consistent across the globe, and gives the relevant authorities the best opportunity of early detection. Successful disease detection is currently much more likely in developed countries (Jones et al., 2008; Woolhouse, 2008), which have well-structured surveillance capabilities. Surveillance in the rest of the world is improving through international collaboration and funding and this effort needs to be maintained if we are to respond adequately to the threat posed by pathogens such as SBV.

The rapid dissemination of peer-reviewed data relating to emerging diseases through scientific journals plays a critical role, along with consideration of the economic and social impacts, in the development of appropriate, evidence-based responses by...
state veterinary and other services. In this regard, the review by Tarlinton et al. (2012). The challenge of Schmallenberg virus emergence in Europe. *The Veterinary Journal* 194, 10–18.

Helen Roberts
Christine Middlemiss
Nigel Gibbens
International Disease Monitoring, AHVLA, New and Emerging Disease Policy, The Department for Environment and Rural Affairs Nobel House, 17 Smith Square, London SW1P 3JR, UK
E-mail address: helen.roberts@ahvla.gsi.gov.uk (H. Roberts).

**References**

Jones, K.E., Patel, N.G., Levy, M.A., Storeygard, A., Balk, D., Gittleman, J.L., Daszak, P., 2008. Global trends in emerging infectious diseases. *Nature* 451, 990–993.

Tarlinton, R., Daly, J., Dunham, S., Kydd, J., 2012. The challenge of Schmallenberg virus emergence in Europe. *The Veterinary Journal* 194, 10–18.

Woolhouse, M., 2008. Epidemiology – Emerging diseases go global. *Nature* 451, 898–899.