The (Non)story of Bluetongue

While some disease outbreaks hit the headlines for the wrong reasons, the sophisticated measures behind successful efforts to prevent others fail to attract media attention

Bernard Dixon

Few of us would bother to read a newspaper report or web page headed “No Cases of Brucellosis in Paris This Month,” “U.S. Potato Crop Unaffected by Phytophthora infestans,” or “Smallpox Remains Eradicated.” That is my answer when I hear scientists complaining about headlines. We simply do not want to read articles about Mount Etna not erupting, ships failing to collide in the Atlantic, or banks not being robbed.

Unless headlines attract our attention, we will not read the story below. Criticism may be justified, of course, when facts are misrepresented or their significance distorted. But it is unrealistic to criticize headlines for their inherent purpose of stimulating our interest.

There is another problem. Some headlines and articles are never written at all because they might appear negative and pointless. A communicable disease outbreak averted is a pertinent example. The (non)incident might reflect a formidable, positive achievement for scientific technique and analysis. Yet it would be far less likely to twitch the antennae of media gatekeepers than an actual epidemic, however small.

A telling example appeared on my screen recently. Headed “Why Were There No Outbreaks of Bluetongue in the UK during 2008?,” it was a paper in the Veterinary Record (164: 384, 2009) discussing the elapse of a full 12 months during which not one of Britain’s sheep or other ruminants developed bluetongue, a severe condition that can cause high levels of mortality and abortion. The authors, John Gloster and others at the Institute of Animal Health, Pirbright Laboratory, Woking, and the Met Office in Exeter, United Kingdom, were concerned to identify the reasons for the absence of the disease (so called because of characteristic hemorrhages on the tongue).

Their paper makes it clear that the virtually certain explanation for the absence of bluetongue was a well-executed vaccination campaign, backed by intensive studies of the infection since it appeared in continental Europe in 2006. Yet no newspaper headlines heralded the achievement. Contrast this with the frenzy when the United Kingdom first appeared to be threatened, two years ago. Coming shortly after a foot-and-mouth disease incident in southern England, fear triggered hysteria in both the print and broadcast media.

“British Livestock at Risk from Deadly Blue-tongue Virus,” announced the Independent on Sunday (12 August, 2007). “Britain is on the verge of a major new farmyard catastrophe with a disease called bluetongue that has ravaged mainland Europe and is poised to arrive in this country for the first time,” said the article. “It has devastated flocks throughout Europe. Now climate change threatens to bring this new nightmare to British farms.”

Bluetongue is undoubtedly a serious condition. Nevertheless, there was a marked disparity between the doom-laden headlines of 2007 and the absence of any headlines at all to mark the successful control of the infection throughout 2008.

First described in South Africa in the late 18th century, bluetongue appeared following the introduction of Merino sheep from Europe. Restricted at first to sub-Saharan parts of Africa, the infection spread later to the southern Mediterranean basin. There were occasional appearances in the Iberian Peninsula between 1956 and 1960, but much more recently the disease caused longer outbreaks on various Mediterra-
nean islands and then extensive regions of the southern mainland of Europe.

As well as being disseminated through the movement of infectious livestock, bluetongue virus (BTV) is transmitted via windborne carriage of biting midges of the genus *Culicoides*. Warmer winters are thought to have facilitated its movement northwards into Europe. But anxieties about an encroachment into the United Kingdom can be traced to the arrival of a particular serotype, BTV-8, in the Belgian/Dutch/German border area around Maastricht, and then France, Luxembourg, Belgium, and the Netherlands in 2006. In contrast to the serotypes responsible for the previous outbreaks in southern Europe, this was closely related to a 1982 west African strain. How it travelled to northern Europe remains uncertain.

BTV-8 came to light initially in Britain in September 2007, at a center breeding rare animals in Suffolk. By the end of the year, investigators had identified a further 75 infected farms in eastern and southern England. Then came the winter, when the absence of insect vectors would be expected to preclude transmission of the virus. By early summer, 2008, however, the disease was again rampant on the northern European mainland. But in Britain, except for a few cases identified through post mortems on animals imported from infected areas, BTV was not detected. There was no transmission, and no outbreaks, at any time during the year.

John Gloster and his colleagues indicate in their paper that immunization of susceptible animals was probably the reason. Scientists and manufacturers developed the vaccine remarkably quickly following the emergence of BTV-8. Over 22 million doses were ordered, delivered equally speedily, and deployed in accordance with a graded plan in which areas at greatest risk were prioritized. Farmers too were impressive in their diligence—over 80% of those in the most vulnerable regions of the country opting for immunisation.

A sophisticated computer model was used to assess and compare different levels of risk of the airborne introduction of infected midges into the UK from the Continent. The model embraced several influences on the transmission cycle of BTV between host ruminants and midges—both the rate of virus replication inside the midge and the insect’s life cycle being quicker at higher temperatures. The weather also affects the likelihood of midges becoming airborne. Dry, calm, and warm conditions are most conducive to high activity.

The computer model had two different modal configurations. The first, “worst-case” version assumed the release of standard particles, to represent the movement of an air mass, around sunset (when midges are most active), from seven sites just across the English Channel on the Continent. The second, based on the same sites, took into account the influence of season on midge activity, together with effects of temperature, wind speed, relative humidity, and precipitation, both at “take off” and en route. Information generated in these ways was made available on a daily basis throughout the period (April to November) when there was any risk of BTV transmission.

“In 2006, there were several days when the flight conditions were suitable but a small region of infected midges precluded their transport to the UK,” Gloster and his coauthors write. “In 2007, the model showed favourable conditions, and a modest number of infections arose in the UK. By 2008, when vaccination against BTV-8 had been undertaken, the midge model again indicated favourable flight conditions, but no UK infections were initiated.”

None of this means, of course, that the problem has been permanently solved. Continued immunization is necessary, as the vaccine may not afford protection for more than one year. Controls on the movement of potentially infected animals will have to continue in force. And UK sheep remain at risk from another virus serotype, BTV-1, which has been detected in Brittany, and against which the French authorities have launched a vaccination programme. A final danger comes from yet another serotype, BTV-6, which was identified in the Netherlands towards the end of last year—and for which no vaccine is yet available.

Like Britain’s year free of bluetongue, intensive ongoing work to contain these continuing risks has not hit the newspaper headlines. Meanwhile, journalists rush to report even minor activities of pathogens (such as influenza virus) to which they and their editors are sensitized. Weird, isn’t it?