

A close to real time surveillance, reporting and detection system for control and elimination of transboundary livestock diseases

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I became a veterinarian in 1968, just as Great Britain was recovering from a serious outbreak of foot and mouth disease. Like all students who hoped to pass their final examinations, I repeated the litany I had been taught: the world beyond our shores was feckless so we must forever live under the sword of Damocles, always vulnerable to just one infected sausage in a tourist's luggage. Only a few nations – like us, had demonstrated the stern rigor necessary to eliminate foot and mouth and to stamp out subsequent introductions – despite the qualms of an uncomprehending public - by swift and sweeping slaughter that must needs make no distinction between those infected and those not. In 2001, I watched my generation of leaders in Britain implement what they had been taught in the 1960s and their equivalents in the USA plan for even greater catastrophes to be triggered by diseases deliberately introduced by terrorists. They demonstrated very clearly to the world that it is only the ways we have chosen to respond to foot and mouth in the past that enable terrorists to threaten us with such diseases in the future. There is another way to end both threats.

Within our lifetimes, we must resolve to eliminate those transboundary diseases that threaten global agribusiness and trap tens of millions of subsistence farmers in poverty. We cannot build walls around our countries tall enough to keep these infections out: they must be removed at their sources. We already have the technologies - the problem is that unless we reserve these for use in the future when our animals are dying at home, we must resolve to use them now in those parts of the world that are dark at night. The US Defense Department, through its Biological Threat Reduction Program (BTRP), has just such goals for a broad swathe of the world from Ukraine through the Caucasus and Central Asia to China. I will describe this Program and its implications in this paper.

On a national and international scale, BTRP is combining new ways to understand and relate four realms in close to real time to eliminate disease. These realms are:

1. The physical world – through geographic information systems, the locations, populations, interactions and relationships of the farms, sale barns, slaughter plants and other structures that constitute animal agriculture, even down to tracking the movements of individual animals through their lifetimes
2. The biological world – how to detect microorganisms, understand how they cause disease and counter infection; the nature of innate and acquired host resistance; the ecological locations of disease
3. The virtual world – the Internet and world wide web along with information technology and all that these allow humans to comprehend and share globally
4. The temporal world – time is the critical dimension: the more time there is, the more options there are likely to be, and it is more likely that one of these options will be favorable. Time is gained through automation, robotics, and by real time communication of even complex analytical data from people or diagnostic devices on farms to decision makers far away by cell phone or wireless computer.