tious agents to be introduced as biological warfare is a concern because several countries, including Iraq, have successfully made such weapons, despite being a violation of international treaty.

The number of emergent infectious diseases is on the rise, and the dimension of their threat has been magnified both by the risk of biological warfare as well as by global travel and trade. "Infectious diseases that are emergent today are grim reminders of what will continue to happen in the future," said Murphy. The need to strengthen surveillance and response networks has been voiced repeatedly through CDC, WHO and CISET reports. We certainly are not short on plans for action, and while they may differ with respect to strategy, they all appear to be joined by one common theme — insufficient resources. Beating the microbes will require more than plans.

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. . . but new plans for surveillance are still being proposed

From tuberculosis and AIDS to potato blight and bovine spongiform encephalopathy (BSE), infectious diseases kill not only people, but whole economies. The links between seemingly far-flung events involving pathogens and their hosts deserve a new kind of scrutiny if we are to deal effectively with emerging and reemerging infectious diseases. Indeed, some experts now contend it would be prudent to anticipate important consequences — perhaps by preparing formal "infectious disease impact statements" — before embarking on substantial public or private development projects, particularly when they are planned for easily disturbed habitats.

Until now, researchers and public health officials have "compartmentalized" infectious diseases, usually according to the causative agent or the target host, rather than viewing them as part of a broad continuum, according to Anne Vidaver, head of plant pathology at the University of Nebraska in Lincoln.

Vidaver and others with different expertise but a common interest in infectious diseases are calling for a far more comprehensive strategic approach to surveillance, basic and applied research, and immunization, treatment or other appropriate responses. They are also urging Congress and a slew of departments and agencies to better coordinate the currently diffuse range of infectious disease-related programs within the US government.

Their plans are ambitious, to say the least. They encompass human, plant and animal diseases as well as the viral, bacterial and fungal agents that cause them and the insects or other vectors that help disseminate them.

It is well known that there is reason for concern that current approaches are not sufficient. Infectious disease remains the leading cause of human deaths worldwide, accounts for about one-quarter of all physician visits in the United States, and adds up to a sizable fraction of all health care costs, says Gail Cassell of the University of Alabama in Birmingham. Drug-resistant pathogens, food- and water-borne agents, and emergent pathogens such as HIV and the hantaviruses are but a few of the manifold problems now occupying this segment of human medicine.

Along the border of human and nonhuman infectious diseases, attention focused this spring on BSE in British cows and its potential link to a small cluster of cases involving young adults who died from a neurodegenerative disorder that resembles so-called "mad cow disease." Although BSE has not been detected in US cattle herds, comparable encephalopathies affect elk and mule deer that occupy overlapping habitats in the western US and Canada, according to Victor Nettles of the College of Veterinary Medicine at the University of Georgia in Athens. No one is claiming a link between the disease found in feral animals and any cattle or human illnesses. But surveillance seems prudent. Some herds of domesticated elk carry tuberculosis and others brucellosis, diseases that will surely cause problems if they spill over into cattle herds. And tuberculosis has now also been found in free-ranging deer in Michigan, again posing an economic threat to local cattle herds.

Meanwhile, new forms of rabies seem to be moving between wild and domesticated animals, and a new bacterial disease detected in song birds is causing serious and economically damaging outbreaks among poultry flocks. And in major crop plants, new or reemergence infectious diseases are also causing problems for farmers, including a resurgent potato blight and several new or reemergence forms of devastating infectious diseases in wheat.

With so much at stake and so many dimensions to account for, some experts are calling for an anticipatory, more systematic approach to activities that impinge on infectious diseases. For example, earlier this year, a task force of the World Health Organization in Geneva, issued a plan recommending formal assessments of major land use projects if they risk increasing the incidence of diseases such as malaria by disturbing local environments. The WHO task force also suggests that funding organizations, especially the World Bank, routinely conduct such health assessments as they now do environmental assessments.

Independently, Edward McSweegan of the US National Institute for Allergy and Infectious Diseases in Bethesda, Maryland, has outlined a plan for a formal infectious disease impact statements, based on the established process for developing environmental impact statements. McSweegan argues that the drafting of an infectious disease impact statement would "provide a more rational basis" for predicting and perhaps controlling infectious disease outbreaks on a local or even international level.

These days, the US political climate makes even the well-established environmental impact statement requirement something of an endangered species, casting doubt on the near-future implementation of the infectious disease impact statement concept. Nevertheless, a message about the broader importance of infectious diseases has been percolating in Washington policy circles. Last year, for example, top officials in the Clinton Administration explicitly elevated emerging and reemerging infectious diseases to the level of a national security issue.

However, when even established programs are seriously underfunded (see facing page), the likelihood of adequate money for any new recommendations is minimal.

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