adverse events that may be associated with HBOCs include hypertension, arrhythmia, gastrointestinal problems, pancreatitis, and liver enzyme elevation, Silverman said.

Several HBOC manufacturers presented data about subgroups that seem to benefit from HBOC treatment. Some presentations highlighted problems encountered during clinical trials, such as the failure of study sites to adhere to patient-selection criteria, and urged that HBOC trials be allowed to go forward.

But University of California, San Francisco, professor and hematology expert Richard Weiskopf said HBOC manufacturers that want their products approved need to be more forthcoming.

“We are dealing with a limited amount of clinical information in the public domain,” Weiskopf said. “We all know that some trials have been finished and data never submitted to a regulatory authority. This raises issues not only of efficacy and safety . . . but I think it also raises issues of ethics.”

“To those in the audience and elsewhere who believe that their data are not correctly interpreted,” he said, “the answer is to be more transparent, with a great deal of clarity.”

—Kate Traynor
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Warming Earth could face new flu, disease threats

If climate affects the behavior of seasonal influenza viruses, then a warming United States could one day face prolonged flu seasons, a leading infectious disease expert said in May.

“In temperate zones, we think of influenza very much as a winter disease. It’s seasonal to us,” said Columbia University epidemiology professor Stephen Morse, during the American Institute of Biological Sciences annual meeting in Arlington, Virginia.

“A warmer climate in what otherwise is a temperate area could convert influenza from what we see as a wintertime disease . . . to a two-peak disease in subtropical areas, or even year-round,” Morse said.

To illustrate this, Morse gave the example of Hong Kong, a mostly subtropical to temperate area with average cold-season temperatures well above freezing.

In the Chinese territory, influenza cases usually peak between January and March, similar to the peak period in the United States. But the virus stages a return around July and August, resulting in two major infection periods each year.

Hong Kong’s health department states that flu cases occur year-round, requiring constant vigilance by schools, other institutional settings, and the general population.

Morse said the influenza infection pattern in Hong Kong occurs almost universally in subtropical areas that conduct flu surveillance.

“In the tropics, the picture is a little more complicated. Some people argue that it’s year-round,” Morse said. “In other tropical settings there appear to be at least two major peaks—winter and summer; or dry-season [and] rainy season.”

“This is amazing,” Morse said. “What people think of as a winter disease does very well under hot, humid conditions.”

Morse said there are many potential ways that climate may affect influenza, such as increasing viral mutation rates and carriage of the virus in birds, the natural hosts of most influenza viruses. Human and social factors, such as movement from rural to urban areas and changes in poultry-rearing practices, may also change in a warming world to the advantage of influenza viruses.

But no one knows for certain how climate change will affect influenza viruses.

“There are many hypotheses but no testable explanations at this point,” Morse said.

Not just influenza. The World Health Organization (WHO), in the agency’s January 2008 secretariat’s report, called the health risks posed by climate change “significant, distributed throughout the globe, and difficult to reverse.”

The report said rising temperature will alter the distribution and increase the number of vector-borne, food-borne, and water-related infectious diseases. Most troublesome, according to WHO, are infectious agents that move into areas where humans lack immunity to the pathogen or live in a region without a good public health system.

Americans are at risk for such infections, as illustrated by the recognition in 1993 of hantavirus pulmonary syndrome
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(HPS), an often-fatal illness that was first reported in the southwestern United States.

HPS is caused by a virus carried in rodents—chiefly, in the United States, a species of deer mouse, according to the Centers for Disease Control and Prevention (CDC).

HPS cases were reported in Arizona, New Mexico, Colorado, and Utah after a drought-ending rainfall caused a 10-fold explosion in the deer mouse population, increasing human contact with the rodents, according to CDC.

“That is an example where a change in climate—in this case, rainfall [and] to some degree, temperature—resulted in a change in the occurrence of human disease,” Morse said.

Rift Valley Fever, a zoonotic disease that sometimes affects humans, has spread from Africa to the Arabian Peninsula, a migration that the United Nations Food and Agriculture Organization (FAO) attributes in part to climate change. Another such example is bluetongue virus, which infects ruminants and was once confined to subtropical Africa and Asia but is now found in Europe, according to FAO.

Avian influenza. Pandemic influenza is an unavoidable undercurrent in the scientific discussion about infectious disease and climate change.

FAO declared last December that “the spread of avian influenza typifies the potential of major health crises with an increased risk of pathogens traveling over large distances in very short time periods, favored by globalization and climate change.”

WHO in mid-May reported 382 confirmed human cases of avian influenza, 241 of them fatal, since 2003. Thirty-one human cases and 24 deaths have been documented so far this year, according to WHO.

Although human cases of avian influenza garner much attention, the bulk of the problem centers around birds that carry the virus and can spread it to new places.

FAO stated that the virus is endemic in birds in some countries, resulting in “extensive outbreaks . . . with the attendant risk of the emergence of a pandemic virus.”

Morse said climate change may alter the flight paths of birds, including those that carry avian influenza viruses and could introduce them to new populations.

“Migratory birds follow traditional flyways for the same reason that main-landers go to Hawaii in February. They seek more conducive conditions when the weather turns bad,” Morse said.

“Will these birds continue to take those flyways which they’ve taken for many years when climate changes, or will they change their pattern?” he asked. “I suspect that they will eventually adapt, just like all other living things, to find their comfort zone.”

For now, Morse said, research on how climate affects avian influenza and other infectious diseases is important, as is surveillance to rapidly detect new disease patterns throughout the world.

“We are a global village, and the microbes certainly are taking full advantage of that,” he said.

—Kate Traynor
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News Briefs

• For the fourth consecutive year, U.S. pharmacy schools conferred at least twice as many first professional degrees on women as on men, according to data released in May by the American Association of Colleges of Pharmacy. A total of 6541 women and 3171 men received their first professional pharmacy degree in the 2006–07 academic year. These graduates represent about 25% of the students who enrolled four years earlier, in the fall of 2002, for their first professional pharmacy degree.

• The American Pharmacists Association House of Delegates in March adopted a policy supporting nationally recognized standards and guidelines for the accreditation of education and training programs for pharmacy technicians. Delegates also adopted a policy supporting the continued growth of accredited education and training programs for technicians.

• FDA in May approved a formulation of recombinant coagulation factor VIIa that may be stored long-term at room temperature. NovoSeven RT, by Novo Nordisk, may be stored at 2–25 °C until the expiration date; NovoSeven, the original formulation, must be kept refrigerated at 2–8 °C. A Novo Nordisk spokeswoman said the new product will be available in August, at which time the company will stop shipping the refrigerator-only product. The two products are made in similar vial sizes: 1, 2, or 5 mg of recombinant coagulation factor VIIa per NovoSeven RT vial; and 1.2, 2.4, or 4.8 mg of recombinant coagulation factor VIIa per NovoSeven vial. Each package of the newer product will include a vial of histidine diluent for use in reconstituting the lyophilized powder.

• The University of Michigan Health System’s Asthma Quality Improvement Steering Committee, which includes Annie Sy, Pharm.D., was one of three winners of the U.S. Environmental Protection Agency’s 2008 National Environmental Leadership Award in Asthma Management. Sy is the clinical pharmacist for the outcomes management program at the health system. The award recognizes comprehensive asthma management programs for innovative and effective strategies that improve patients’ health and quality of life.