Climate change tied to spread of diseases

By Doug Struck
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TORONTO — Valere Rommelaere, 82, survived the D-Day invasion in Normandy but not a mosquito bite. Six decades after the war, the Saskatchewan farmer was bitten by a bug carrying a disease that has spread from the equator to Canada as temperatures have risen. Within weeks, he died from West Nile virus.

Global warming — with an accompanying rise in floods and droughts — is fueling the spread of epidemics in areas unprepared for the diseases, many health experts worldwide say. Mosquitoes, ticks, mice and other carriers are surviving warmer winters and expanding their range, bringing health threats with them.

Malaria is climbing the mountains to reach populations in higher elevations in Africa and Latin America. Cholera is growing in warmer seas. Dengue fever and Lyme disease are moving north. West Nile virus, never seen in North America until seven years ago, has infected more than 21,000 people there and killed more than 800.

The World Health Organization (WHO) has identified more than 30 new or resurgent diseases in the past three decades, the sort of explosion some experts say has not happened since the Industrial Revolution brought masses of people together in cities.

"We didn't even know West Nile virus existed here," said Maria Bujak, 63, of Toronto. Her husband, Andrew, contracted the disease in their garden in 2002, never fully recovered and died two years later.

"Tropical diseases are here to stay in Canada. We needed our government to wake up and tell us that," said Douglas Elliott, a Toronto lawyer who has brought suit against the Ontario government on behalf of about 40 who were infected, contending the government did not do enough to alert the public.

Scientists have warned for more than a decade that climate change would broaden the range of many diseases. But the warnings were couched in the future — and qualified.

Higher elevations

The spread of disease is affected by many uncertainties, including unforeseen resistance to antibiotics, failures of public-health systems, population movement and yearly climate swings. For that reason, some scientists have been cautious about the link between disease and global warming.
warming.

But Paul Epstein, a physician who worked in Africa and is now on the faculty of the Harvard Medical School, said that, if anything, scientists weren't worried enough about the problem.

"Things we projected to occur in 2080 are happening in 2006. What we didn't get is how fast and how big it is, and the degree to which the biological systems would respond," Epstein said. "Our mistake was in underestimation."

The incremental boost already detected in Earth's temperature, for example, has expanded the range and activities of disease carriers.

"Insects are exquisitely sensitive to temperature changes," a report prepared by Epstein and others at Harvard's Center for Health and the Global Environment noted in November.

The clearest case for that, according to the report's authors, is in cold areas. Higher elevations of Africa, the Andes mountains in South America and the Alps in Europe are warming at a faster pace than lowlands. As ice caps and glaciers melt, forests inch higher, and insects carry diseases from warmer lowlands farther up the slopes.

A WHO report in 2000 found that warming had caused malaria to spread from three districts in western Kenya to 13 and led to epidemics of the disease in Rwanda and Tanzania. In Sweden, cases of tick-borne encephalitis have risen in direct correlation to warmer winters. Asian tiger mosquitoes, the type that carry dengue fever, have been reported recently as far north as the Netherlands.

As seas warm, other breeders thrive. Cholera, a waterborne disease, emerged in South America in 1991 for the first time in the 20th century. Abetted by poverty and poor public health, the disease swept from Peru across the continent and into Mexico, killing more than 10,000 people.

Diseases also are expanding in a surprisingly complex dance with their environment, taking advantage of the swings from deluge to drought made more frequent by global warming, Epstein said.

A common house mosquito, the Culex pipiens, for example, unexpectedly thrives in drought. It lives in drainpipes and sewer puddles. During long dry spells, the stagnant pools teem with protein and attract thirsty birds on which mosquitoes feed. Meanwhile, droughts reduce the populations of dragonflies, lacewings and frogs that eat mosquitoes.

More than a pest

The Culex pipiens is a favored carrier of a disease first identified in a feverish woman in the West Nile district of Uganda in 1937.

The disease was found again in Israel in the 1950s and in Romania in 1996. Each outbreak followed an unusual dry, hot spell, typical of adverse weather becoming more frequent as a result of climate change, researchers at the University of Haifa in Israel concluded.

In 1999, the virus landed in New York, probably at LaGuardia Airport. Disease sleuths speculate it was lurking in a mosquito stowaway or in the bloodstream of someone already infected. That summer also brought unusually hot, arid weather to New York.

Before the year had ended, 62 people had been infected and seven had died. The next two years were more temperate, but the disease exploded across the United States and into Canada when another hot, dry summer hit in 2002.

Susan Harrison, then 45, prepared a Labor Day barbecue that year with her husband and two daughters on the deck of their Toronto home. She was bitten by a mosquito, but shrugged it off.

In a few days, she felt a shooting pain in her legs. Within two weeks, she could not get out of bed. She was put on a respirator and spent three months in intensive care. She now uses a wheelchair, her legs and right arm paralyzed by West Nile virus.

The virus killed 304 people in North America in 2002 and 276 the next year. The toll dropped to about 100 in 2004, probably because of cooler weather and mosquito-control measures.

Despite the recent drop in the death toll, birds and horses in hot western regions are still being devastated, and the
disease has likely not finished with humans.

"West Nile virus hasn't gone away. People still need to be aware that it's there," said Edward Hayes, a medical epidemiologist with the Centers for Disease Control and Prevention in Fort Collins, Colo. "Whether we have large-scale epidemics is anyone's guess."

Climate change already is claiming more than 150,000 lives each year, with causes ranging from heat waves to respiratory illness, WHO concluded last year.

Some scientists see global warming as a natural cycle that will reverse itself soon, but the handwriting is increasingly clear for many governments.

Britain's environment minister warned last year that malaria might be on its way. South Africa's environmental affairs minister said last year that the country could face a fourfold increase in malaria by 2020.

The Canadian government now attributes the boost in West Nile virus to climate change and last year warned that the country might eventually experience dengue fever, yellow fever and malaria.