RESEARCH

GLOBAL STUDY LINKS CHEMICALS TO HEALTH IMPACTS

JENNIFER PRITCHETT
TELEGRAPH-JOURNAL
27 FEB 2013 09:05AM

SAINT JOHN – A University of New Brunswick Saint John professor is one of the experts behind a new international report that shows how a wide range of chemicals are impacting human and animal health.

The report, released by the World Health Organization and the United Nations Environment Programme, highlights key concerns about how endocrine disrupting chemicals (EDCs) are interfering with the way hormones function.

Karen Kidd, who holds a Canada Research Chair in Chemical Contamination of Food Webs, said the global review looked at how the science around the impact of these types of chemicals on health has advanced over the last decade since the last review of its kind was completed and the results are concerning.

“The first message is that there are increasing rates of diseases and disorders in humans and the second message is that there’s more evidence that these increases may be in part due to chemical exposure,” she said in an interview.

Endocrine disruptors are chemicals that interfere with normal hormone action to impact metabolism, development and reproduction in humans, birds, mammals, amphibians, reptiles and invertebrates.

“The hormones work a bit like a key in a lock and so the chemicals can act like a key and turn that lock or they can interfere with the key getting into the lock or they can interfere with the transport of the chemicals through the blood to the lock, the receptor,” said Kidd.

These chemicals are found in a vast range of products, including additives or contaminants in food, pharmaceuticals, personal care products, cosmetics, plasticizers, textiles, cleaners, flame retardants used in furniture and household items, construction materials, pesticides and many banned substances such as PCBs.

The study, entitled The State of the Science of Endocrine Disrupting Chemicals, points to a number of different health problems with links to chemicals, including reproductive and endocrine diseases such as breast and prostate cancer, endometriosis, infertility, early puberty, diabetes and obesity.

It also shows links to autoimmune diseases, asthma, heart disease, stroke, as well as brain and nervous system diseases such as Alzheimer’s disease, Parkinson’s disease, ADHD (Attention Deficit Hyperactivity Disorder) and learning disabilities.

The report maintains that incidences are increasing faster than can be explained by genetics alone and are likely linked to environmental factors such as chemical exposure.

Kidd, who's based at the UNB Saint John campus, said humans and wildlife are exposed to many different chemicals each day – not all of them are endocrine disruptors.

Dozens of chemicals that are in the blood, fats and breast milk of humans are very similar to those found in fish, whales and polar bears, states the study.

Kidd said that scientists understand how some of these individual chemicals are interfering with the endocrine system in wildlife, but there remains a big knowledge gap about how the effects of these mixtures are affecting wildlife and humans.

The idea of the global report, she said, is to raise the profile about the issue in Canada and globally, particularly amongst policy makers.

"It is critical to reduce the risk that some chemicals pose to human and wildlife health," she said. "We are especially concerned about the developing fetus and newborns because chemical exposure at these early stages in life can reprogram tissues and lead to diseases and disorders later in life."

The global review indicates how some chemicals are present in wildlife and humans, even in remote polar environments, because of their transport over long distances through wind and water currents.

Some chemicals persist and are stored in the body while others are rapidly excreted, lasting only a few hours, it states.

The global report points to increasing evidence of how chemicals affect wildlife in similar ways to humans. For example, exposures to PCBs are linked to lower thyroid hormones in marine mammals, fish, birds and humans. The synthetic estrogen in the birth control pill is effective in preventing pregnancy in humans and reproduction in fish because, but once it's makes its way into municipal wastewaters, it also feminizes male fish and reduces their ability to spawn.

The study states that levels of chemicals in the body are closely linked to trends in their use.

"We know that when we ban chemicals like DDT and PCBs, wildlife populations have recovered," said Kidd. "In North America there were declines in a number of top-predator bird species like osprey or eagles when DDT (an insecticide) was heavily used. Now that it has been taken off the market, those birds species are coming back."