

## **Drug residue tainting water, report warns**

Health experts call for regulatory scrutiny of risks posed by remnants of medication.

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TORONTO -- Residues from drugs and cosmetics are widespread contaminants in Canadian waterways, and should be subject to increased oversight by regulators because they represent a possible health hazard, says a report that is being released today.

The report, by the Canadian Institute for Environmental Law and Policy, said tests of the past decade in the United States and Europe have found water to be laced with residues from cosmetics and 100 drugs, and while studies in Canada have not been as extensive, the situation is unlikely to be much different because of the high use of these products.

"It is reasonable to assume . . . that pharmaceuticals and other emerging contaminants are widely present in the streams, lakes, rivers and groundwater in the densely populated regions of the country," the report states.

In 2004, Canadians filled just under 400 million prescriptions in drugstores. Large quantities of drugs are administered in hospitals and in farming, where antibiotics and growth hormones are used routinely on livestock to make them grow faster. Fifty per cent to 90 per cent of the active ingredients in drugs are not absorbed by the bodies of humans or farm animals and are excreted, which means they enter sewage and from there are released into surface waters.

Joanne Parrott, an Environment Canada scientist, said water contamination by drug residues appears to be a localized problem. She said traces of drugs are usually found in sewage effluent or in rivers below sewage pipes. In larger rivers or lakes, residues are diluted to below detection levels because of the large volumes of water.

"You lose them, they're gone," said Ms. Parrott, who works at the National Water Research Institute in Burlington, Ont.

She said that while drug residues have been found in some drinking water samples in Canada, there have been cases where researchers "couldn't detect anything at all."

Nonetheless, there is concern over the residues, and Health Canada is developing regulations to cover them, said Kiran Hanspal, a director at the federal agency.

The report said the amount of residue in drinking water is often a thousand to a million times lower than the therapeutic doses administered to sick people.

It also said that some medicines, such as the anticonvulsant carbamazepine, the antidepressant Prozac and the insect repellent DEET "are quite stable in water and should be treated as persistent environmental contaminants."

CIELAP, a Toronto-based environmental think tank, said in its report that another problem with drug residues is that many compounds are hormones, or can behave like hormones. It cited recent Environment Canada research that found a fish population collapsed after being exposed to water containing only five to six parts per trillion of estrogen, levels similar to those discovered downstream from sewage treatment plants, where the hormone is found because of its use in birth-control pills.

A part per trillion is roughly equal to a drop of water in a train of tank cars stretching 16 kilometres.

The minnows died out because of impacts on their fertility. Males began producing egg yoke protein, which usually occurs only in females, and had little or no sperm.

Not enough is known about the impact of drug and cosmetic residues on human health, according to the report's author, Susan Holtz, who recommends that governments increase research funding on the topic.

She speculated that the increase in the incident rate of hormonally based cancers, such as those of the testicle, prostate and breast, may be linked to exposure to contaminants in the environment.

Among its recommendations, the report calls for provinces to develop a system for safe disposal of unused or expired drugs similar to the one used for hazardous household waste.

The aim of such a program would be to reduce the amount of drugs poured down drains or thrown into garbage.

The report says British Columbia has a voluntary program run out of drugstores that could be a model for other provinces. In the program, patients can return unused medication.

## Prescription for problems

The report by the Canadian Institute for Environmental Law and Policy says Canadian water is likely to be laced with pharmaceutical and cosmetic residues because of the high use of these products.

### Retail prescriptions dispensed in Canada, 1994-2004, in millions

1994	219.7
1995	228.2
1996	234.6
1997	241.9
1998	254.2
1999	271.6
2000	290.7
2001	312.6
2002	335.0
2003	361.4
2004	381.6

**Source:** IMS HEALTH