

Are Boys An Endangered Species?

Why half as many boys as girls are being born in places around the world.

By Francesca Lyman for MSN Health & Fitness

Half as many boys as girls are being born in some places around the world—and pollution is the prime suspect.

Among the Chippewas of the Aamjiwnaang First Nation community living on the shores of the St. Clair River outside Sarnia, Ontario, tribal leaders were puzzling over a variety of health problems—from asthma to cancer to miscarriages—plaguing their families. The Aamjiwnaang—the name means “at the spawning stream”—were shaken when they realized that there was a dramatic disproportion of girls to boys among them.

Jim Brophy, director of the Occupational Health Clinic for Ontario Workers’ Sarnia branch, remembers the look of shock on their faces when they suddenly made the connection. “It was like a deep family secret getting out,” Brophy recalls. “They had enough girls for three baseball teams, but not enough boys for even one boy team.”

Since then, the Chippewas of Aamjiwnaang’s 850 band members—who live near a cluster of chemical plants known as Chemical Valley—have worried that the air and water around them contribute to the drop in the number of their male children, as well as a host of grim diseases associated with toxic chemicals.

And now, in a number of villages at the northernmost reaches of the Arctic Circle—seemingly remote from any hazardous chemicals—scientists have found a similar syndrome: populations spawning twice as many girls as boys. Based on preliminary data released in September 2007, researchers are blaming high levels of man-made chemicals that have made their way up the food chain, through fish and other marine species, and into indigenous seafood diets.

Indigenous Arctic peoples show high levels of chemical contamination, researchers say, because they depend on local fish, marine animals, seabirds and reindeer meat, which are significantly more contaminated than imported food by persistent organic pollutants like PCBs, dioxin and DDT.

So far, researchers from the Arctic Monitoring and Assessment Programme have linked the dramatically skewed declines in male baby births with chemical contamination. But they haven’t determined the exact biological mechanisms by which these changes are taking place.

However, according to Lars-Otto Reiersen, executive secretary of AMAP in Oslo, Norway, “PCBs, DDTs and other persistent organic pollutants are known from research to possibly trigger male and

female hormone signals incorrectly.”

These strange and disturbing cases are by no means the only ones providing clues that there can be changes to the sex ratio—the normal, and usually fairly even, proportion of male to female live births. One of the first examples of this phenomenon came when thousands of people were contaminated by dioxin in a 1976 industrial accident at a chemical factory in Seveso, Italy. After the accident, researchers followed the children of the people affected to discover that half the number of boys as girls were born in the next generation.

Lars-Otto Reiersen and other Arctic researchers fear the same thing could be happening in the Russian Arctic. “Arctic indigenous populations, whose lifestyle is based on the consumption of traditional country foods, are subject to some of the highest exposure levels to PTS (persistent toxic substances) of any population groups on Earth,” according to the AMAP report.

Also alarming is the decline in male births around the world, a trend some scientists find troubling. In the United States, more boys are being born than girls, but the gap between the two has declined in the last 30 years.

One of those worried is Devra Davis, director of the University of Pittsburgh Cancer Institute’s Center for Environmental Oncology and professor of epidemiology at the university’s Graduate School of Public Health. Davis is the lead author of a June 2007 article in the journal *Environmental Health Perspectives* that found statistically significant reductions in male births and increased fetal deaths in Japan and among Caucasians in the United States since 1970. She and her co-authors note that this decline represents 135,000 fewer white males in the U.S. and 127,000 fewer males in Japan stretching over the past three decades than the normative rate would expect.

“There are environmental and other factors—probably not genetics, because such changes couldn’t happen in a decade or two—working to threaten the ability of the human species to make healthy babies,” Davis told MSN.

Most parents think their chance of having a baby girl or a baby boy is 50-50. However, normally, it’s more like 51-49, since on average there are 105 or 106 males born for every 100 females.

Throughout history, males have usually outnumbered females slightly, according to Christopher Wills, a Professor of Biological Sciences at the University of California, San Diego. Nature, or evolution, compensates for the fact that males are more fragile by producing more of them, Wills says, “so that the ratio of males to females is about 1.2 to 1 at conception.”

Given this natural tilt toward male births, the declining probability of having a male baby is ever more troubling to Davis; it’s what she considers a “sentinel” indicator of ill health in the

population—indicating, as she and her co-authors wrote, that “males are being culled in some systematic fashion.”

Davis and the University of Pittsburgh team also found that an increasing proportion of fetuses that die are male. They say a range of environmental factors may explain these trends: whether they originate in paternal exposures or maternal exposures before conception—possibly, as they write, “prenatal exposures to endocrine disrupting environmental pollutants at a critical stage of sexual differentiation.”

However, the reasons behind these trends aren’t clear. “Normally, many more boys than girls should be born,” Davis told MSN, “and they aren't being born. Something is obviously wrong, but we don't know how to explain this.”

Not everyone agrees that the small decline these researchers point to is so consequential.

The American Chemistry Council, which represents U.S. chemical manufacturers, won’t discuss these statistics, but refers reporters to Dr. Harry Fisch, a longtime researcher on male reproductive health who dismisses the idea that these global trends are being triggered by endocrine-disrupting chemicals. [Fisch says he is not affiliated with the ACC or a paid consultant to the organization, although he has accepted several reimbursements for travel expenses from ACC to international meetings to discuss his own independently-funded research].

“Over the years, there have been major fluctuations,” says Fisch, a professor of urology at Columbia University, College of Physicians and Surgeons, “True, there are less boys being born compared to girls, during the last few decades, but only fractionally.”

Fisch, author of *The Male Biological Clock*, blames older parental age as a more likely explanation than pollution for some of these unexplained trends like skewed sex ratio, noting that a recent Centers for Disease Control and Prevention study found that older mothers and older fathers tended to produce fewer boys. “Before you start saying that chemicals in our global environment are the culprit, you have to look at your own personal environment,” he adds. “The bottom line is that we're seeing a trend toward older parents.”

Fisch also dismisses worries over a drop in sperm counts and increases in hypospadias, and argues that the neurodevelopmental problems affecting boys—the sixfold increase in autism, for example—can be attributed to more people having children at older ages, not environmental chemicals.

However, many public health professionals argue the opposite: That drops in male births and

general declines in reproductive health ought to be examined even more closely in connection with endocrine disruption.

“This is a very serious issue that speaks to our future reproductive health,” argues OHCOW’s Jim Brophy. “We tend to look at chronic diseases, like cancer and autism, in isolation, while these reproductive issues—higher rates of miscarriage, for example—tend to go below the radar and may offer clues for the huge rates of diseases we’re seeing.”

Population biologist Christopher Wills offers another concern connected with the greater fragility of males: It isn’t just that males are being born in lesser numbers, but that their lives are being foreshortened, especially in places hit hard by pollution.

“Just look at the life expectancy for men in Russia—it’s age 73 for women, but age 59 for men,” says Wills. “This may turn out to be the real elephant in the bedroom.”

Francesca Lyman is the author of several environmental books, including *The Greenhouse Trap* and *Inside the Dzanga-Sangha Rain Forest*. Her work has appeared in *The New York Times*, *The Washington Post*, *Ms. Magazine*, *Seattle Metropolitan*, *MSNBC Online*, *This Old House*, and *Horizon Air* magazines.