

Endocrine Disruption, Public Health and National and International Security

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*This essay is in response to: What emerging environmental hazard should be next on the policy agenda? A question posed through the Environmental Health Policy Institute, an initiative of Physicians for Social Responsibility.**

From a national and international security perspective endocrine disruption should be right at the top of our list of concerns. Wait a minute, you ask, what is endocrine disruption? Well, endocrine disruption is the insidious trespass of man-made chemicals into every vital organ system in your body that comprises or is controlled by the endocrine system, such as the thyroid and parathyroid, pancreas, adrenals, thymus, male and female reproductive organs, the heart, digestive system, and skeletal system -- all the systems that participated in how you were constructed in the womb and how you are functioning today. Animals, including humans, have evolved along with many natural chemicals that can interfere with the endocrine system, but it has only been since the mid-1950s, when vast volumes and numbers of new synthetic chemicals derived from fossil fuels were introduced into commerce, that widespread disruption of the endocrine system has emerged as an international public health issue.

Modern toxicology dates back to the 18th century, but it was not until the 1950s that the "postmodern period of toxicology" burgeoned, concurrent with the release of many man-made chemicals after WWII. As a result, this new toxicology grew under the guidance of those making the chemicals and those using them in their products. The stated goal was to determine at what concentration a chemical could be released into the environment before it caused harm. But in the late 1970s and early 1980s it became obvious that something had gone disturbingly wrong. Wildlife, laboratory animal, and human epidemiological studies were linking a series of adverse health effects with specific chemicals or classes of chemicals, effects on the endocrine system that had been missed by the traditional toxicological protocols developed to determine the safety of chemicals. Disorders of the endocrine system, now at epidemic proportions, include learning disabilities and behavioral and mood problems, infertility, abnormal gonad development, cancers of the reproductive organs, unusual pubertal onset, diabetes, obesity, allergic and asthma reactions, and more.

In the past few decades, scientists with impeccable credentials have come from outside the discipline of toxicology using entirely new protocols to test chemicals for their safety. Based on the principles of developmental endocrinology, starting with exposures in the womb and taking a disease-based (not chemical-based) approach, they have linked widely dispersed chemicals with many disorders that are currently burdening society and governments with inestimable costs for diagnosis, treatment, alleviation, and life-long care. A plethora of peer reviewed studies tracking chemical exposure prior to conception throughout life, using assays designed to detect subtle molecular and cellular effects, confirm the complexity and sensitivity of the endocrine system.

Unfortunately, legislation is lagging behind science, and currently only the crude reproductive and developmental effects detected in traditional toxicological assays are acknowledged by governments. The present approach of regulating chemicals under the short-sighted guise of using reproduction and grossly observable birth defects as a substitute for endocrine disruption is failing to protect human and ecological health. It is time for governments to protect the global activity of all the endocrine subsystems as one. Just as the term "cancer" has become the

catchall for all the different kinds of cancer, involving numerous organs and tissues, and differing in their intensity and ability to metastasize, the term “endocrine disruption” must be accepted for its ultimate damage to the structure and function of the entire endocrine system. No new standards and regulations designed to protect human health should leave out endocrine disruption, including all the downstream alterations in the multiple subsystems of the endocrine system.

The wealth of 21st century peer-reviewed literature, combined with the latest public health statistics, demonstrates that a myopic strategy will lead only to greater dysfunction at the population level. Fewer and fewer people will be healthy and intelligent enough to provide the leadership society needs to work toward world peace. Fossil-fuel derived chemicals are depriving humanity of its integrity and the fate of the human race should no longer be put at risk because current toxicological testing has failed to detect damage from chemical exposure that does not fall under the current antiquated regulatory rubric. From an economic and national security perspective the costs are too high to delay any longer.

*The Environmental Health Policy Institute, an initiative of Physicians for Social Responsibility, is an online forum of physicians, health professionals, and other environmental experts weighing in on the most pressing environmental hazards of our time. For more information on the work of the largest physician-led organization in the country working to protect the public from the threats of nuclear proliferation, climate change, and environmental toxins, please visit www.psr.org.

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