Last week we saw that 29 types of birth defects are increasing steadily in the United States, some increasingly rapidly, others more slowly. Some of these increases are due to better diagnosis; however, many of the increases are real. This week we examine 10 reasons why birth defects are rising and will almost certainly continue to rise.

There is abundant scientific evidence that birth defects in laboratory animals and in humans have occurred as a result of exposure to five classes of pollutants: radiation;[1-2] pesticides;[3-9] metals (including mercury, cadmium, lead, and others);[10-14] solvents;[15-23] and dioxin-like chemicals including PCBs [polychlorinated biphenyls].[24-27] From studies of pharmaceutical drugs found to cause birth defects, it is certain that other chemicals are teratogens (causing birth defects) as well.[28]

Because municipal landfills and toxic waste dumps are laced with pesticides, toxic metals, solvents, dioxin-like compounds, and sometimes even radioactive materials, at least seven studies have now reported finding unusually high numbers of birth defects in children born to parents residing near dumps.[29-35]

** The main reason why birth defects will continue to increase is that more than 500 new chemicals are introduced into commercial use each year. There will never be enough money available for independent scientists to conduct definitive (or even adequate) studies of all these chemicals to see if they cause birth defects in laboratory animals. For ethical reasons, chemicals cannot be tested in an organized way on humans (though, contrarily, most Americans don’t object to the experimental exposures that occur routinely in the workplace, and in the home via consumer products). In addition to 500 new chemicals appearing each year, more than 50,000 chemicals already in commercial use have never been tested for their ability to cause birth defects.

** The prevailing American philosophy is that chemicals are innocent until proven guilty. Therefore, when new chemicals are released into the environment, the burden of proof rests on the general public to show that damage has occurred before scientific studies are undertaken to describe the damage in detail. This philosophy guarantees that people MUST BE HARMED before study can begin.

** Scientific studies can take years to complete. Even when an effect is grossly obvious, pinning down the cause can take a decade or longer. For example, mercury poisoned dozens of babies in the womb at Minamata, Japan, in 1955 but scientists did not clearly establish the cause for 15 to 18 years.[11]

** After research scientists are convinced, there is a long delay before the general public learns the facts, if it ever does. (As an anti-environmental viewpoint comes to dominate major media, such as the NEW YORK TIMES, LOS ANGELES TIMES, and 20/20 on ABC-TV, in many cases new information simply never gets widely disseminated).

** Furthermore, the results of studies may not be clear-cut, for many reasons: it is difficult to measure exposure so usually a “surrogate” for exposure is used, such as place of residence, or occupation; many birth defect studies rely upon mothers recalling what chemical exposures occurred during their early months of pregnancy and all such recollections are dubious; therefore it is difficult to absolutely rule out many possible causes of an observed effect.

** A society that demands scientific certainty before it will restrict the use of suspected teratogens, guarantees that the rate of birth defects will continue rising. Scientific certainty about anything involving humans is, and will remain, elusive and rare.

** Given the philosophical climate, public health officials are reluctant to raise an alarm on less-than-100%-certain data. As a practical matter, an official will get in much more trouble for raising a false alarm about a suspected chemical than for making the opposite error (which allows birth defects to continue). In the present philosophical climate (requiring scientific certainty), even well-justified alarm based on less-than-certain data draws an angry response from powerful moneyed interests. On the other hand, allowing birth defects to continue will only affect one family at a time. Individual, unorganized victims do not threaten a public health official’s job security.[36]

** When studies reveal that a particular chemical probably causes birth defects, the producers and users of the chemical typically conduct a lengthy campaign to deny and obscure what is known. For example, the lead industry has known for at least 100 years that lead causes reproductive and developmental disorders in humans. But starting in 1925 medical doctors hired by the lead industry argued that lead occurs naturally in the human body and, therefore, the dangers of lead in gasoline were not worth worrying about, much less studying. This philosophy was persuasive to the public health community for 40 years.[37]

** The public health community relies almost exclusively on a decision-making technique that cannot take into account multiple exposures and cumulative effects, a technique called “risk assessment.” (See REHW #393, #394, #395.) At its best, risk assessment can provide a ballpark guesstimate of a few of the many hazards created by a single toxic chemical. However in real life we are all exposed to multiple chemicals; all the time, and risk assessment cannot account for cumulative effects and multiple interactions. Heavy reliance upon such an unrealistic tool for decision-making leads to decisions that harm public health.

** Finally, even the knowledgeable environmental community fails to fully adopt the clear requirements of a public health policy based on prevention of disease: persistent toxic pollutants must be banned. Recently when Environmental Defense Fund (EDF) and Physicians for Social Responsibility (PSR), followed separately by Greenpeace, published their recommendations for public policy on dioxin, they all argued that U.S. dioxin policy should be modeled on U.S Environmental Protection Agency’s lead policy.[38] (Greenpeace set a goal of zero dioxins, but recommended the lead policy as a way to get there.) Over the last 20 years EPA’s lead policy has forced a mere 8% reduction in total U.S. “consumption” of lead. At this rate it will take 3500 years for lead “consumption” to fall below 1000 pounds per year and thus disappear as a public health problem.

--Peter Montague

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In statistical terms, public health officials will get in less trouble for making a Type I error than a Type II error. Therefore, experiments are often designed to favor avoidance of Type I errors rather than Type II errors.


[38] Julia Moore and others, PUTTING THE LID ON DIOXINS (Washington, D.C.: Physicians for Social Responsibility, 1994); Joe Thornton, ACHIEVING ZERO DIOXIN (Washington, D.C.: Greenpeace, 1994). PSR and EDF failed to call for real prevention; instead they advocated that the major source of dioxin emissions (incinerators) be operated "at optimal conditions" rather than be shut down or phased out.

Descriptor terms: birth defects; congenital anomalies; radiation; pesticides; mercury; lead; cadmium; pcbs; dioxin; landfilling; minamata; japan; new york times; los angeles times; 20/20; tv; journalism; news media;