

# Children's Environmental Health



## Birth Defects

### 15. Industrial Release of Toluene and Trichloroethylene to the Air

#### Indicator 15. Releases of Toluene & Trichloroethylene to the Air<sup>endnote</sup>

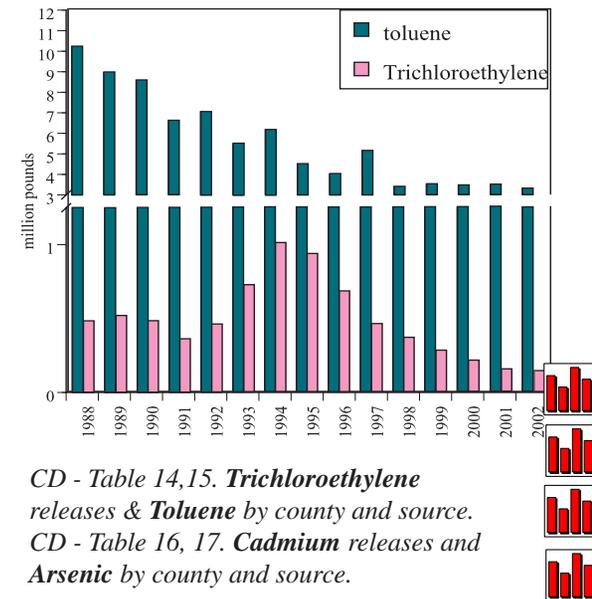
Chemicals have long been suspected of causing or contributing to birth defects. For some environmental agents, the evidence for a role in birth defects is strong. For example, an increased risk of oral clefts associated with maternal smoking is much better established than other environmental risks for cleft palates.<sup>1</sup>

A number of studies have pointed to the potential threats posed by toxic pollutants to the developing fetus. Animal and limited human studies show that exposures to volatile organic chemicals like toluene and trichloroethylene during pregnancy can cause learning deficiencies and altered behavior in offspring.<sup>2</sup> At least two epidemiological studies have linked cardiac defects with trichloroethylene exposure from contaminated well water.<sup>3</sup> Trichloroethylene is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids and spot removers. Toluene is used in making paints, paint thinner, fingernail polish, lacquers, adhesives, rubber and in some printing and leather tanning processes. During 2002, 142,713 pounds of trichloroethylene was released by 10 industries and 3.2 million pounds of toluene were reported released to the air by 60 industries in Kentucky.

Evidence also suggests that prenatal exposure to certain heavy metals such as cadmium and arsenic is associated with a number of adverse reproductive outcomes such as embryoletality, congenital malformations and intrauterine growth retardation.<sup>3</sup> The amount of cadmium and cadmium compounds released to the environment has dropped in Kentucky during the past decade, from 8 million pounds in 1991 to 250 pounds in 2002. Electric Steel, in Boyd County, was the only facility that reported releases of cadmium in Kentucky during 2002.

Exposure to high levels of lead during pregnancy can also contribute to miscarriage, preterm delivery, low birthweight and developmental delays in the infant.<sup>4</sup> During 2002, more than 1 million pounds of lead were released to the environment in Kentucky, according to the Toxics Release Inventory. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Other studies suggest that the immune system was affected in children born to mothers exposed to PCBs. Kentucky health officials have issued PCB fish consumption advisories for 788 miles of waterways including the entire stretch of the Ohio River along the state's border. Green River and Metropolis lakes also have PCB fish consumption advisories in effect.<sup>5</sup> There are also 105 waste sites in Kentucky contaminated with PCBs of which 43 have been remediated.<sup>6</sup>

In recent years, scientists have raised concerns about possible pregnancy risks from by-products of chlorinated drinking water. When chlorine combines with other materials in water, it forms chloroform and related chemicals called trihalomethanes. A few studies suggest that the risk of miscarriage and poor fetal growth may be increased when levels of these chemicals are high, while other studies have not found an increased risk. Scientists continue to study the safety of these chemicals during pregnancy.<sup>7</sup> In Kentucky, 96,628 people were served by systems currently exceeding the THM drinking water standard based on a 4 quarter running annual average.<sup>8</sup>



CD - Table 14,15. *Trichloroethylene releases & Toluene by county and source.*  
 CD - Table 16, 17. *Cadmium releases and Arsenic by county and source.*

#### Total Trihalomethanes Exceeding 0.080 mg/L July 1, 2003 - June 30, 2004\*

Water System	population serve	average
Ashland Water Works	49,335	0.081
Liberty Water Works	3,973	0.081
Edmonson County Water Dist/Wax	14,553	0.106
Jackson County Water Association	14,346	0.091
Mt. Sterling Water Works	14,421	0.095

\* based on a 4 quarter running annual average. mg/L - milligrams per liter.  
 Source: Kentucky Division of Water