American College of Obstetricians & Gynecologists
American Society for Reproductive Medicine
World Health Organization
Britain's Royal College of Obstetricians & Gynecologists

- acknowledge that exposure to toxic chemicals during pregnancy and lactation is ubiquitous
- Virtually every US pregnant female has at least 43 different chemical contaminants in her body

There are over 84,000 chemicals in commerce in the USA, 15,000 of which are used in high volume, and only about 200 of these have been tested for safety. Only 5 chemicals have been banned.

Unlike the pharmaceutical industry, the chemical industry does not have the same regulations or regulatory bodies to ensure safety.

It is not surprising that a National Cancer Institute Report finds that "to a disturbing extent babies are born 'pre-polluted.'"

Toxics of Major Concern

Persistent Organic Pollutants

(DDT, Aldrin, Dieldrin, Endrin, Chlordane, Heptachlor, Hexachlorobenzene, Mirex, Toxaphene, Polychlorinated Biphenyls, Dioxins, and Furans)

- immune dysfunction
- neurological deficits
- reproductive anomalies
- behavioral abnormalities
- carcinogenesis
- reduction in population of natural killer cells (lymphocytes)
- rates of infections 10-15 times higher
- inner ear infections
- trans-placental and lactational transfer of maternal burdens

Phenols

(BPA, triclosan, parabens)

- female reproductive toxicity (recurrent miscarriage, infertility)
- aggression and hyperactivity in female children
- impaired behavioral regulation (anxious, depressive, and hyperactive behaviors) in girls ages 3 years
- reduced neonatal thyroid-stimulating hormone TSH in boys
- decreased thyroxine concentrations
- estrogenic activity
- long-term exposure associated with cardiovascular disease, kidney, liver, and lung damage
- when ingested in food, water or by accident, causes gastrointestinal damage, muscle tremors, difficulty walking, and even death
- respiratory irritation
- skin irritations including burns and blisters

Phthalates

(butyl benzyl phthalate (BBzP), dibutyl phthalate (DnBP), di-2-ethylhexyl phthalate (DEHP), diethyl phthalate (DEP), di-butyl phthalate (DBP), benzyl butyl phthalate (BBP), diisobutyl phthalate (DiBP), diisononyl phthalate (DiNP), di-n-octyl phthalate (DnOP), dipentyl phthalate (DPP), di-isobutyl phthalate (DiBP), di-isononyl phthalate (DiNP), di-n-octyl phthalate (DnOP), di-isohexyl phthalate, dicyclohexyl phthalate (DcHP), and di-isoheptyl phthalate)

- shortened gestational age
- male reproductive tract development (reduced anogenital distance)
- male fertility issues
- impaired neurodevelopment
- reduction in executive function at age 4-9 years
- endocrine disruptor
- asthma

- attention-deficit hyperactivity disorder
- behavioral issues

Heavy Metals

(cadmium, lead, mercury, arsenic)

- high acute toxicity includes death
- alterations of epigenetic signatures in the DNA (DNA methylation) of the placenta and newborns
- reduced IQ
- increased risk of emotional problems in 7-8 year-old boys
- alterations in genomic methylation
- impaired neurodevelopment
    - decrease in cognitive function and performance
    - decreased intelligence quotient
    - increased incidence of attention-related and antisocial behaviors
    - decreased hearing measured in children
    - reduced intellectual development
- reduced psychomotor outcomes
- neurobehavioral deficits
- difficulty breathing and swallowing
- anemia
- increased risk of skin, liver, bladder, and lung cancer

Perchlorate

(rocket fuel, fertilizers, fireworks, flares)

- altered thyroid function in newborns

Pesticides

(Aldrine/Dieldrin, Atrazine, Chlordane, Chlordecone, DDT, DDE, DDD, Endosulfan, EndrinEndrin aldehyde, Heptachlor/Heptachlor Epoxide, Hexachlorobenzene, Methoxychlor, Methylene Chloride,

Pentachlorophenol, Polychlorinated Biphenyls PCBs, Pyrethrins and Pyrethroids, Toxaphene)

- impaired fetal growth
- impaired cognitive function
- impaired neurodevelopment
    - increased risk of pervasive developmental disorder at age 2
    - increase in attention problems and attention deficit hyperactivity disorder behaviors at age 3
    - reduction in working memory capabilities and IQ at age 7
- increased susceptibility to testicular cancer, breast cancer into adulthood
- childhood cancers (leukemia & brain tumors)

Solvents

(benzene, gasoline, ethyl alcohol, methanol, phenol, styrene, toluene, trichloroethylene, and xylene)

- spontaneous abortion and fetal loss
- decreased fetal and birth weight
- congenital malformations

Child Health Outcomes

Virginia T. Ladd, President and Executive Director of the American Autoimmune Related Diseases Association (AARDA), explained:

"With the rapid increase in autoimmune diseases, it clearly suggests that environmental factors are at play due to the significant increase in these diseases. Genes do not change in such a short period of time."

WHO sites increasing incidences of immune-related diseases and note perinatal events are critical for later life host defense and that the maturing immune system is a vulnerable window to toxic effects.

A growing number of childhood diseases such as allergic disorders, cancers, and other diseases are linked to environmental exposures during prenatal and early postnatal development.

The developing immune system can be permanently altered or "programmed" by the early exposure to environmental agents.

Due to the critical role the immune response has in defending the body from diseases, it is important to consider the effects of toxicants on children's developing immune system.

- Children's immune system increased sensitivity [World Health Organizations' "Immune Diseases and Children", Children's Health and Environment]
  - 3 to 12-fold dose sensitivity
  - difficult and unpredictable array of alterations
  - persistence of effects
  - latency (alterations are not recognizable until the postnatal immune system is placed under stress)
- over 300,000 children have lupus [Lupus Foundation of America, National Resource Center on Lupus]
- 208,000 children under 20 have diabetes [American Diabetes Association]
- 15% of children have developmental disabilities
- 1 in 13 children in US have a learning disability
- 1 in 12 children have been diagnosed with ADD or ADHD
  - currently about 6.4 million children diagnosed
  - boys (13.2%) were more likely than girls (5.6%) to be diagnosed
- 1 in 142 have an intellectual disability
- 1 in 68 diagnosed with an autism spectrum disorder [Autism Speaks]
  - 1 in 42 boys
  - 1 in 189 girls
- children ages 5-14 have asthma rates of 9.8% [Centers for Disease Control and Prevention]

- youth ages 15-19 have asthma rates of 10.2% [CDC]
- childhood cancer incidence is steadily rising over past few decades [kidsdata.org a Program of Lucile Packard Foundation for Children's Heatlh]

•over 17 children per 100,000 are diagnosed with cancer each year in the US

•in Sonoma County, this rate is 21.1 children per 100,000 (second highest in the state behind Solano County and tied with Napa County