Health Inequalities – Early Years

Women’s Environmental Network Scotland

The Women’s Environmental Network Scotland (WENS) was formed in 2004 as a WEN UK group. Our adopted role was to study and inform ourselves and others on the role of occupational and environmental factors in disease causation. This arose originally from the widespread concern for the ever rising incidence of breast cancer and the failure of conventionally accepted lifestyle/life choice factors to account for it.

It was quickly realised that this approach should be applied to other cancers and a growing body of other ill health problems.

Above all, the implications for our children and their future were also very clear.

WENS will therefore focus on Question 5 and on some of the recent research in the field.

While recognising the well-established major role of social and economic factors, these do not entirely explain the rapidly rising incidence of many illnesses over the last century. Much scientific research has filled in some of the gaps with the role of exposure to environmental and occupational damaging substances and situations.

Far from detracting from the role of social and economic factors, this is very closely related to such factors and strengthens them. It recognises the need for an approach which shows the complexity of factors involved - personal, psychological, family, social, economic, environmental and occupational.

Developments in science and technology over the last half of the 20th century, particularly in endocrinology, epigenetics and physics, has brought us a flood of new scientific study.

The groundbreaking Black Report on Health Inequalities was published in 1979. Its findings - although withheld from public scrutiny until published later as a Pelican book, concluded that the greatest single contribution to improving Public Health in the UK would be the elimination of child poverty.

It is sobering to note that that was 35 years ago and in spite of many excellent studies in subsequent years and some measures to attempt to alleviate it, we are still facing the same problem, exacerbated in the current economic situation. The Committee are to be congratulated for a timely raising of this issue again.

WENS wishes to draw the Committee’s attention to a number of key research reports. I have chosen extracts from a few of the thousands of published studies to illustrate.
1. The Environmental Working Group-a body of scientists, researchers, planners and many other disciplines who undertake or commission research on a wide range of environmental issues. Some of their work was presented in the video “10 Americans”, available on the EWG.org website and on YouTube. A summary of their findings is as follows:

**Body Burden — The Pollution in Newborns**
Executive Summary US Environmental Working Group July 2005
A benchmark investigation of industrial chemicals, pollutants and pesticides in umbilical cord blood

The umbilical cord is a lifeline between mother and baby, bearing nutrients that sustain life and propel growth.

Not long ago scientists thought that the placenta shielded cord blood — and the developing baby — from most chemicals and pollutants in the environment. However we now know that at this critical time when organs, vessels, membranes and systems are knit together from single cells to finished form in a span of weeks, the umbilical cord carries not only the building blocks of life, but also a steady stream of industrial chemicals, pollutants and pesticides that cross the placenta as readily as residues from cigarettes and alcohol. This is the human "body burden" — the pollution in people that permeates everyone in the world, including babies in the womb.

In a study spearheaded by the Environmental Working Group (EWG) in collaboration with Commonweal, researchers at two major laboratories found an average of 200 industrial chemicals and pollutants in umbilical cord blood from 10 babies born in August and September of 2004 in U.S. hospitals. Tests revealed a total of 287 chemicals in the group. The umbilical cord blood of these 10 children, collected by Red Cross after the cord was cut, harbored pesticides, consumer product ingredients, and wastes from burning coal, gasoline, and garbage.

This study represents the first reported cord blood tests for 261 of the targeted chemicals and the first reported detections in cord blood for 209 compounds. Among them are eight perfluorochemicals used as stain and oil repellants in fast food packaging, clothes and textiles — including the Teflon chemical PFOA, recently characterized as a likely human carcinogen by the EPA’s Science Advisory Board — dozens of widely used brominated flame retardants and their toxic by-products; and numerous pesticides.

Of the 287 chemicals we detected in umbilical cord blood, we know that 180 cause cancer in humans or animals, 217 are toxic to the brain and nervous system, and 208 cause birth defects or abnormal development in animal tests. The dangers of pre-or post-natal exposure to this complex mixture of carcinogens, developmental toxins and neurotoxins have never been studied. More at www.ewg.org
Breast feeding
WENS has supported those who work with women to increase the numbers and the period of breast feeding. While doing so we are aware that 212 toxins have been isolated from breast milk. This should surely give urgency to a programme to clean up our environment. Even so, we still advocate the breast is best. Substitute milks are equally contaminated and lack the protective factors for human babies in human milk.

We have long since known and acknowledged the effects on the foetus of maternal exposures to alcohol and tobacco. This work expands on this.

1. CEHAPE Children’s Health and Environment Action Plan Europe: The idea of a children’s environment and health action plan for Europe was born in 1999 where the urgency of taking action to achieve safe environments for children and to protect children from environmental risk factors was acknowledged. The Children’s Health and Environment programme set up by the WHO regional office for Europe was endorsed.

3. Major reports have been published in the past two years, by the WHO: State of the Science of Endocrine Disrupting Chemicals 2012; by the European Commission: The State of the Art Assessment of Endocrine Disrupters; by the international Endocrine Society in a Scientific Statement on Endocrine disruption.

One graph showing incidence and mortality in childhood cancer says: Children are among the most vulnerable humans. The figure shows cancer incidence and mortality in children under 20 years of age. While the graph show a steady decline in mortality rates between 1975 and 2005, it shows a steady rise in the incidence.

Asking “why should we be concerned, it answers: A significant increase in reproductive problems; increasing incidence of reproductive cancers; decrease in fertility rates; an increasing number of chemicals shown to interfere with hormone synthesis, action and metabolism; similar patterns shown to occur in animal research; EDC exposures linked to obesity, cardiovascular disease, diabetes and metabolic syndrome; many increasing in incidence and with it the global health expenditure.

4 From Harvard School of Public Health Learning disabilities. Cerebral palsy. Mental retardation. A "silent pandemic" of these and other neurodevelopmental disorders is underway, owing to industrial chemicals in the environment that impair brain development in fetuses and young children. That’s the conclusion of a data analysis by researchers at the Harvard School of Public Health and the Mount Sinai School of Medicine, who point to 201 chemicals--most of them common--known to inflict lasting neurological damage in humans. Information on possible neurotoxic effects exists, however, for only a small fraction of the thousands of chemicals in use around the world.
The findings, published online in The Lancet on November 8, 2006, stem from a careful review of publicly available data by lead author Philippe Grandjean, an adjunct professor in HSPH's Department of Environmental Health, and Philip Landrigan, a professor of pediatrics and chair of Community and Preventive Medicine at Mount Sinai. Their research was funded by the Danish Medical Research Council and, in the United States, by the National Institute of Environmental Health Sciences and the Environmental Protection Agency.

In their report, the researchers urge countries to adopt the "precautionary" approach for chemical testing and control recently embraced by the European Union. The EU has put into place strong regulations that can later be relaxed if a potential hazard proves less dangerous than anticipated, instead of requiring a high level of proof of toxicity at the outset. By contrast, U.S. requirements for the testing of chemicals for brain toxicity are minimal, the authors say.

"The human brain is a precious and vulnerable organ, and a developing brain is far more susceptible to the toxic effects of chemicals than an adult brain," Grandjean says. "Even limited damage may have serious consequences.

1. Air Pollution Two studies.

A Chinese study showing the benefits of reducing prenatal exposures to coal burning pollutants to children's neurodevelopment in China. Data was taken from studies before and after the closure of a coal burning plant. One piece of good news.

Windows of vulnerability

The reason for quoting even a little of the research on EDCs is that we can now point to the most vulnerable periods of exposure. This is from prenatal development through childhood and puberty and to adulthood. It also shows the possibilities for dealing with huge swathes of serious ill health and premature deaths.

There are specific "windows of development" of organs and tissues during foetal development. If the foetus is exposed to a toxin during that period, normal development can be arrested or distorted. The effect is permanent. The newborn may show a defect at birth but can appear perfectly normal. However, an effect may appear in later life.
Some of the conditions shown to be associated with prenatal exposures to EDCs. They have rapidly increased in incidence over the last 1/2 century.

Conditions of the Reproductive system associated with EDC exposures:

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<thead>
<tr>
<th>Females</th>
<th>Males</th>
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<tr>
<td>Early puberty</td>
<td>Hypospadias,</td>
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<tr>
<td>Impaired fertility</td>
<td>Cryptorchidism</td>
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<tr>
<td>Polycystic ovaries</td>
<td>Impaired fertility</td>
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<td>Fibroids</td>
<td>Reduced sperm count</td>
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<td>Endometriosis</td>
<td>Impaired sperm quality</td>
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<td>Miscarriages</td>
<td>Testicular cancer</td>
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<td>Shorter lactation</td>
<td>Prostate cancer</td>
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<td>Breast cancer</td>
<td>Altered male/female ratio</td>
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<td>Preterm birth</td>
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Boys have higher incidence of behavioural neurological and learning problems and are four times more likely to be autistic.

Other effects found:
- Developmental disorders in offspring.
- (Autism spectrum, learning, coordination, behaviour difficulties)
- Links with late neurological disorders e.g. Parkinson’s Disease, Alzheimer’s Autism spectrum disorders.
- Metabolic syndrome-obesity and type 2 diabetes
- Immune system impairment.
- Hormone dependent cancers
- Allergies
- Can be passed on to 3rd generation

Drawings of children exposed to pesticides (valley) and free from such exposures (foothills study of Mexican children).

There are many issues of importance to be considered in assessing the health of our children.

There are many barriers to achieving this. The reproductive issues raised for future generations are of particular gravity and, according to some experts in the field, could jeopardise the ability of the human race to reproduce itself, in this equalling or surpassing the effects of runaway climate change.

Thus WENS would like to see these factors raised above included in any appraisal of child health.