

## INFANT MORTALITY & TOXIC ENVIRONMENTS: DELAWARE AT RISK

James W. Prescott, Ph.D.

Infant mortality rate reflects the health of the nation, its states and their willingness to care for the mother and infant during pregnancy, birth and the first year of postnatal life. The United States and Delaware do not favor well in comparisons among nation states nor within the 50 States and D.C. The following statistics give a measure of neglect and indifference to pregnant women, her birth and postnatal care of the infant.

The United States ranks 42nd in infant mortality (6.43 deaths per 1,000 live births), among the 226 nation states compared. Impoverished Cuba ranks 40th in infant mortality (6.22 deaths per 1,000 live births) that puts the U.S. to shame. Singapore has the lowest record in infant mortality with a rank of One (2.29 deaths per live births), according to the CIA World Factbook (2006 estimates). Clearly, the United States does not rank well among the nations of the world given the extraordinary wealth and power of the United States. <http://www.violence.de/politics.shtml>

The recent report on infant mortality statistics for the 2004 period (June 13, 2007), National Vital Statistics Reports, National Center for Health Statistics, Centers for Disease Control and Prevention ranks Delaware as the sixth worst state in infant mortality with a rate of 8.88 deaths per 1,000 live births that is exceeded by the states of South Carolina, Tennessee, Louisiana, Mississippi and the District of Columbia. The national average for the United States is 6.86 deaths per 1,000 live births.

. These findings are reinforced by the Health Care State Rankings 2006, which provides rankings of the healthiest states in the United States. Delaware ranks 35 among the 50 States in the overall health of the nation. Health rankings are based upon a composite score based upon ratings of twenty-one health variables (Morgan Quinto Press, 2006).

By these statistics, Delaware is not a very healthy environment to be raising children, which should be of concern to state legislators and all elected public officials. These health problems of Delaware are particularly aggravated by the Indian River Power Plant with its continuing pollution of the environment-- air,

water and earth-- that is contaminated by the emissions from one of the dirtiest coal-fired power plants of this nation.

It is well established that healthy living organisms cannot live in toxic environments. This is particularly the case for our infants and children where the health consequences of toxic environments carry an extraordinary economic cost, as New York's Love Canal and Erin Brockovich's victory over the American West Coast energy giant Pacific Gas and Electric Company, known as PG&E, attest.

[http://en.wikipedia.org/wiki/Erin\\_Brockovich\\_\(film\)](http://en.wikipedia.org/wiki/Erin_Brockovich_(film))

The Beach Life of many Delawareans and for many visitors is one of the great resort areas of the U.S., which gives an illusion of health that is not deserved by the State of Delaware. The First State must become the First State in Health, not one of the last.

A recent 2007 summary of the health hazards of toxic environments has been published, entitled "The Faroes Statement: Human Health Effects of Developmental Exposure to Chemicals in our Environment" by leading national and international health authorities in *Basic & Clinical Pharmacology & Toxicology*. They state:

The periods of embryonic, foetal and infant development are remarkably susceptible to environmental hazards. Toxic exposures to chemical pollutants during these windows of increased susceptibility can cause disease and disability in infants, children and across the entire span of human life. Among the effects of toxic exposures recognized in the past have been spontaneous abortion, congenital malformations, lowered birthweight and other adverse effects. These outcomes may be readily apparent. However, even subtle changes caused by chemical exposures during early development may lead to important functional deficits and increased risks of disease later in life. The timing of exposure during early life has therefore become a crucial factor to be considered in toxicological assessments.

The infant mortality report from the CDC cited above has identified the leading causes of infant mortality.

The leading cause of infant death in the United States in 2004 was Congenital malformations, deformations and chromosomal abnormalities (congenital malformations), accounting for 20 percent of all infant deaths. Disorders relating to short gestation and low birthweight, not elsewhere classified (low birthweight) was second, accounting for 17 percent of all infant deaths, followed by Sudden Infant death syndrome (SIDS) accounting for 8 percent of infant deaths. The fourth and fifth leading causes--Newborn affected by maternal complication of pregnancy (maternal complications),

and Accidents (unintentional injuries), accounted for 6 and 4 percent, respectively, of all infant deaths in 2004. Together the five leading causes accounted for 55 percent of all infant deaths in the United States in 2003(p.9).

The effects of toxic exposure are similar in both reports: spontaneous abortion, congenital malformations, lowered birthweight and complications of pregnancy. It is not possible to separate genetic from environmental factors for there is always and everywhere an interaction. Genotype is not expressed in a vacuum. Toxic environments induce genetic-chromosomal abnormalities and the environment has a major control over genetic expression and, thus, the quality of the environment is crucial to understanding the vast health damages inflicted upon organisms by the environment, particularly the embryo, fetus and very young and elderly.

In a report published in *The New York Times* by Elisabeth Rosenthal, "Parents and Health Experts Try to Ease Italy's Pollution" (6.12.07), it is reported that "Particulate pollution is tied to heart disease and respiratory ailments like asthma, and poor lung development in children" and found that particulate emissions were "really high"--200 micrograms per cubic meter"; and that "During his 24 hours wearing the monitor, his average exposure was 127 micrograms per cubic meter. The World Health Organizations says a safe target for such particles is 10 micrograms per cubic meter." "This is well above the 10 that the World Health Organization recommends, or level of 15 that is the standard in the United States." (Emphasis added).

It was noted that particulate pollution is measured in two ways. "One is PM 10, the longstanding standard, which measures small to medium-size particles. The other is PM 2.5, which measures only the tiniest or "ultrafine" particles that are most closely tied to human illness, according to new research".

The report continues:

According to W.H.O figures, PM 10 caused an average of 8,220 deaths a year in Italy from 2002-2004. No part of Europe is meeting the W.H.O. 10 milligram (sic!) standard for ultrafine particles. For 2006, Milan's average was 38, and there are times with readings in the 150 to 200 range, Dr. Bertollini said"...In a study released last year, scientists estimated that 22,000 fewer people would die annually across 26 European cities if these small particles were cut to the level suggested by the World Health Organization.

It should be noted that these are "deaths" and does not portray the larger health consequences for those who survive.

Unfortunately, particulate emissions are unknown for the Indian River Power Plant. The pollutant not covered by the multipollutant regulation is fine particulate matter, but DNREC officials said future regulations would cover both fine particulates and carbon dioxide. The urgency of harm inflicted demands that immediate action be taken.

The NRG compliance plan must be released to the public immediately as well as the magnitude of particulate emissions of the Indian River power plant that threatens the health, lives and safety of all Delawareans, particularly the children and elderly.

DNREC officials must not delay in issuing amendments to the regulations that would require the immediate reporting of the dangerous particulate emissions of the Indian River power plant. Public health and safety demand that this information be released immediately.

We cannot wait to cross all the "T"s and all the "I" s in specifying specific linkages to affirm that this toxic factor caused this disorder. It is sufficient to know that there are toxic factors in the environment that are injurious to health, which can no longer be tolerated.

A substantial proportion of the increasing emotional-social-sexual disorders of our children and youth over the past fifty years may well be due to the long term toxic poisoning of the brain and body that is carried from generation to generation and is in addition to the more observable factors recognized in infant mortality rates.

The Faroos Statement concludes:

The accumulated research evidence suggests that prevention efforts against toxic exposures to environmental chemicals should focus on protecting the embryo, foetus and small child as highly vulnerable populations. Given the ubiquitous exposure to many environmental chemicals, there needs to be renewed efforts to prevent harm.

On the local level, Delawareans must act by supporting the Citizens For A Better Sussex petition that states: "To the State of DE for immediate enforcement of DNREC Reg 1146 to clean up the Indian River Power Plant & prohibit construction of new coal-burner or gasified coal burner plants in this State".

<http://abettersussex.com>; and the Live Earth Pledge of Al Gore:

<http://liveearthpledge.org/algore.php>.

Citizens of Delaware must demand that the Indian River Power Plant release all information on the toxic elements that are polluting and poisoning our environment and demand increased vigilance and reporting on all aspects of the toxic environment created by corporations.

Citizens of Delaware must support alternative sources of energy like BluewaterWind.com that provides safe, clean and cost-effective energy that will last for generations through wind power.

Al Gore has reminded us of the danger that is imminent

Our home--Earth--is in danger. What is at risk of being destroyed is not the planet itself, but the conditions that have made it hospitable for human beings...This is not a political issue. This is a moral issue, one that affects the survival of human civilization. (*New York Times* 7.1.07, emphasis added).

Since this report was written, Joan Deaver, President, Citizens for a Better Sussex-CBS, provided the following information from John Austin [austin4102000@yahoo.com](mailto:austin4102000@yahoo.com), retired from the EPA, which documents clusters of high infant mortality rates in areas adjacent to the Indian River Power Plant that exceed the infant mortality rate of 8.88 for the State of Delaware. John Austin reports the following:

**"Particulate pollution increases infant deaths.** Just go pull the death rates of *The News Journal* web page.

<http://miva.delawareonline.com/miva/cgi-bin/miva?nj/im.mv+>

No more argument about people moving to DE or smoking" (as explainable causes).

**Infant deaths rates are in deaths per 1000 live births.**

<u>Zip</u>	<u>City</u>
19951	Harbeson 12.8
19966	Millsboro 10.7
19939	Dagsboro 10.5
19958	Lewes 9.1
19947	Georgetown 8.6

Look upstate along the river where there are many pollution sources and:

<u>Zip</u>	<u>City</u>
19801	Wilmington 15.3
19802	Wilmington 12.4
19806	Wilmington 12.1
19805	Ellsmere 10.6
19809	Edgemoor 10.1
19703	Claymont 9.1

It is noted that these data on **"Infant deaths are those during the first year of life and include all deaths between 1992 and 2003"**. These data represent a span of 11 years and cannot be attributed to some random variation, as proposed by Dr. Paul Silverman, Associate Deputy Director, Division of Public Health to account for the cluster of cancer cases found. "But the division never found a definitive link with an environmental contaminant for any of the cases, he said," reported in "Delaware confirms cancer cluster. Study finds higher rate near Indian River power plant" by AARON NATHANS, *The News Journal* (Sun, Aug 5, 2007). Story can be read at <http://abettersussex.com/cancerhere.html>.

The infant mortality rate data are far more convincing as to causes of toxic environments than cancer rates that have far more complexity with the many usual excuses given to place the accountability elsewhere, e.g. smoking. Wilmington with an infant mortality rate of 15.3 is 1.72 times the infant mortality rate of Delaware (8.88) and 2.4 times the infant mortality rate for the U.S. (6.43).

The State of Delaware needs to know where the 107 infant deaths have occurred by city and zip code and not only for the year 2003 but for each and every year from 1990 to 2006. This would provide an invaluable database of seventeen years for establishing the degree to which the Indian River Power plant can be held accountable, as a major contributor to infant deaths in Delaware.

A similar analysis for fetal and perinatal deaths is necessary, as Delaware reported 63 fetal deaths and a fetal death rate of 5.53 for the year 2003; and a fetal/perinatal death rate of 12.2 with 139 fetal/perinatal deaths for 2003. The combined fetal/perinatal deaths include fetal deaths with a presumed gestation of 28 weeks or more plus infant deaths of less than 7 days. (MacDorman, et al, 2007). The number of fetal/perinatal deaths (139) may be a more sensitive barometer to toxic environments than infant mortality rates (107), which deserve a separate evaluation.

MacDorman , et al (2007) state:

Fetal mortality is a major, but often overlooked, public health issue. Much of the public concern regarding reproductive loss has concentrated on infant mortality, in part due to a lesser knowledge of the incidence, etiology, and opportunities for prevention of fetal mortality. Fetal mortality refers to the intrauterine death of a fetus at any gestational age. Fetal deaths are more numerous than infant deaths...The concept of a perinatal period emerged in the late 1940s as clinicians and researchers became increasingly aware of the relatively large number of deaths occurring in the period immediately before and after delivery (3). Thus, perinatal mortality refers to death around the time of delivery, and includes both fetal deaths (of at least 20 weeks of gestation) and early infant (neonatal) deaths (pp1-2).

The conclusion of The Faroes (2007) statement bears repeating here:

The accumulated research evidence suggests that prevention efforts against toxic exposures to environmental chemicals should focus on protecting the embryo, foetus and small child as highly vulnerable populations. Given the ubiquitous exposure to many environmental chemicals, there needs to be renewed efforts to prevent harm.

The cholera epidemic of 1854 in London and the identification of its cause is a powerful model that is relevant here. John Snow, the first epidemiologist, plotted on a map the location of every case of cholera that was reported. The density of cases led to a single well located on Broad Street. Removing the pump handle of the Broad Street Well ended the epidemic of cholera. Perhaps, the Indian River Power plant can be considered analogous to the Broad Street Well, as the number of fetal/perinatal and infant mortalities are plotted on a map of Delaware.

Delaware needs to remove the pump handle of the Indian River Power Plant that is polluting our environment with toxic poisons and require compliance with DNREC Regulation 1146. Does the child endangerment statutes of Delaware apply here? Corporation should be held accountable, as are parents, for child endangerment.

The State of Delaware needs to know to what extent the infants who died during the first year of life were being actively breastfed at the time of their death. Dr. Rivera, Director, Division of Public Health, refused to provide this information when requested by this author. See <http://www.violence.de/politics> for correspondence.

It is important that the State of Delaware requires that the weaning age of every child in Delaware be recorded, as part of the immunological record. Breastfeeding is a singularly important factor in preventing neonatal mortality and for assuring the long-term health of the infant and mother (Edmond, et al, 2006; American Academy of Pediatrics (2005)). A concerted program to support mothers breastfeeding would impact on infant mortality rate, as Edmond, et al (2006) reported that "The risk of neonatal death was fourfold higher in children given milk-based fluids or solids in addition to breast milk."

No assessment of breastfeeding was made in *The Fetal and Infant Mortality Review (FIMR) In Delaware (2005)*. WHO, UNICEF and the American Academy of Pediatrics have recommended exclusive breastfeeding for the first six months of life.

Particulate emissions pose a special health problem for Delaware. John Austin reports:

"While the Indian River Power Plant is a source of 1000-1500 tons PM10 and another 1000-1500 tons PM2.5, there is no down wind PM air monitor in Sussex County. There is one in Seaford and it has **shown non-attainment** (non-compliance) with the new PM 2.5 standards in 2001-2003 (38 ug/m3) and 2002-2004 (36 ug/m3). 2003-2005 squeaked in at 34.7 ug/m3. The standard now is 35 ug/m3, 24-hour average, 98th percentile, averaged over 3 years."

A uniformity of reporting standards needs to be developed where the WHO standard of 10 ug/cubic meter should be the world standard of health for particulate emissions.

No mention of toxic environments or the data that support toxic environments being linked to clusters of higher infant mortality rates have been mentioned in *The Fetal and Infant Mortality Review (FIMR) In Delaware (2005)* nor in *Reducing Infant Mortality In Delaware*"(2005), a glaring omission of the scientific data cited above and the study by Woodruff, Grillo and Schoendorf (1997) that alerted the scientific-political community to this linkage.

There should be no delay in implementing optimal health standards for toxic emissions; recording the living location of fetal, neonatal and infant deaths by zip code and city to establish expected peak clusters; supporting *Citizens for a Better Sussex* petition to require compliance with DNREC Reg 1146; establish downwind PM air monitors in Sussex County; establish a registry of weaning age for every child, as part of the immunological record; and promoting breastfeeding with exclusive breastfeeding for the first six months of life, as some of the measures to be taken to reduce infant mortality in Delaware.

## References

- AAP (2005). Breastfeeding and the Use of Human Milk. *Pediatrics* 115 (2): 496-506.  
[http://aappolicy.aappublications.org/policy\\_statement/index.dtl#B](http://aappolicy.aappublications.org/policy_statement/index.dtl#B)
- CIA (2007). The World Factbook 2007. <https://www.cia.gov/library/index.html>
- Edmond, Karen M., et al (2006). Delayed Breastfeeding Initiation Increases Risk of Neonatal Mortality. *Pediatrics*. Vol 117(3): 380-386  
<http://pediatrics.aappublications.org/cgi/content/abstract/117/3/e380?etoc>
- Editors (2006). Health Care State Rankings 2006. 14th Annual Healthiest State. 2006. Morgan Quinto Press. Lawrence, KS. <http://www.statestats.com>
- Gore, Al (2007). Moving Beyond Kyoto. *The New York Times* July 1.
- Grandjean, Philippe, et al (2007). The Faroes Statement: Human Health Effects of Developmental Exposure to Chemicals in Our Environment. *Basic & Clinical Pharmacology & Toxicology*. Department of Environmental Medicine, Institute of Public Health, University of Southern Denmark. Denmark  
[http://www.precaution.org/lib/faroes\\_statement\\_final.070801.pdf](http://www.precaution.org/lib/faroes_statement_final.070801.pdf)
- MacDorman, M.F., Hoyert, D.L., Martin, J.A., Munson, M.L., and Hamilton, B.E. (2007). *Fetal and Perinatal Mortality, United States, 2003*. National Vital Statistics Reports 55(6). February 1. Centers For Disease Control and Prevention. Hyattsville, MD  
[http://www.cdc.gov/nchs/data/nvsr/nvsr55/nvsr55\\_06.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr55/nvsr55_06.pdf)
- Mathews, T.J. and MacDorman, M.F. (2007) *Infant Mortality Statistics from the 2004 Period. Linked Birth/Infant Death Data Set*. National Vital Statistics Reports, Centers For Disease Control and Prevention. June 13. Hyattsville, MD. <http://www.cdc.gov/nchs>
- Rivera, J.H. (2005). *The Fetal and Infant Mortality Review (FIMR) In Delaware: Findings From the Pilot Study and Lessons Learned About Implementing A Stateside FIMR*. (August). Delaware Health and Social Services. Division of Public Health. Dover, DE.
- Rivera, J.H. (2005). *Reducing Infant Mortality In Delaware. The Task Force Report* (May). Delaware Health and Social Services. Division of Public Health. Dover, DE.  
[www.dhss.delaware.gov/dhss/dph/files/infantmortalityreport.pdf](http://www.dhss.delaware.gov/dhss/dph/files/infantmortalityreport.pdf)
- Rosenthal, Elizabeth (2007). Parents and Health Experts Try to Ease Italy's Pollution. *The New York Times* June 12.
- Woodruff, T.J., Grillo, J. and Schoendorf, K.C. (1997). The relationship between selected causes of postneonatal infant mortality and particulate air pollution in the United States. *Environ Health Perspective*. June 105(6): 608-612. EPA. Washington, D.C.  
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1470072>
- WHO/UNICEF (1990). *The Innocenti Declaration.. Breastfeeding In The 1990s: A Global Initiative* Florence, Italy 1 August: [http://www.violence.de/politics.shtml#WHO\\_Innocenti\\_Declaration](http://www.violence.de/politics.shtml#WHO_Innocenti_Declaration)

The author is a health research psychologist who is in semi-retirement living in Lewes, DE. He was formerly Health Scientist Administrator, Developmental Behavioral Biology Program, National Institute of Child Health and Human Development, National Institutes of Health (1966-1980). 12 July 2007.