

# N.J. scientists study birth defects for link to 9/11 stress and dust

BY PEGGY O'CROWLEY  
STAR-LEDGER STAFF

When major disasters have struck in other parts of the world, scientists have noticed an increase in birth defects, as well as a rise in the birth of females following the events.

Now New Jersey scientists are looking into whether the high levels of stress and exposure to pollutants during the World Trade Center attack are causing the same things to happen here.

In one of the first such studies in this country, researchers will collect information on all the births in New Jersey and New York between Sept. 11, 2001, and Sept. 11, 2002. They will examine birth records of about 300,000 babies, including those born in the two previous years to Sept. 11, 2001, to form a control group.

The scientists are from the Center for Childhood Neurotoxicology and Exposure Assessment at the Environmental Health Sciences Institute in Piscataway, a joint venture between the University of

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### Scientists study birth defects

in Kobe, Japan, as well as a 1976 industrial accident in Seveso, Italy, which discharged a large toxic cloud over the town. Similar findings were also made in a recent Danish study of pregnant women who experienced a sudden traumatic loss.

"With 9/11, obviously there was serious stress to the general population and exposure to some chemicals. One of our concerns is what effects will it have on the most susceptible populations, children and unborn children," said George H. Lambert, a pediatric toxicologist, neonatologist and director of the center. The study may also explain how extreme emotions affect human development. While scientists have an understanding of how stress causes birth defects, its connection to sex ratio remains unclear, he said.

One theory is that it ensures the propagation of the species, he said.

"If you're going to increase the population, you'd rather have 99 fertile females and one male than 99 males and one fertile female," he said.

Lambert, a co-leader of the study, will be looking at stress on babies, while Paul Liroy, a physicist, will be working on effects of exposure to the dust cloud that rose from the wreckage of the World Trade Center.

Experiments already are being conducted at the center's lab to test whether materials from the dust cloud elicit reaction from human hormone receptors implanted into yeast.

"The vast majority of the material was innocuous, mostly cement dust," Liroy said. "But there were chemicals called thalates, a by-product of combustion of plastics in the fire. The temperature of the fire was sufficient enough to form reasonable quantities and a fairly large concentration of parts per million."

Thalates have been linked to hypospadias, or malformation of the male urethra, in animals, according to Lambert.

Fortunately, Liroy said, dioxin levels were fairly low. Lambert said researchers expect negative findings will more likely be caused by stress.

The researchers will be getting information like birth weights, length of gestation (to determine premature births) and gender from birth certificates on file with the state departments of health. They will then cross-reference the certificates with birth defect registries maintained by each state.

Lambert said researchers can zero in on specific ZIP codes and census tracts with as few as 4,000 people to identify potential patterns. Using meteorological reports from Sept. 11 and beyond, Liroy created a computerized model of the dust plume to track its course over the metropolitan area.

### More evidence

Studies linking stress and disasters with changes in sex ratios and/or birth defects:

**Seveso, Italy.** In 1976, a toxic cloud containing heavy concentrations of dioxin was released from a factory in the northern Italian town of Seveso. Dioxin has been linked to cancer, lower sperm counts and miscarriage, as well as birth defects such as cleft palate. A University of Milan study found parents who were exposed to the chemical cloud had 46 daughters and 28 sons. Almost twice the normal ratio.

**Kobe, Japan.** In 1995, a huge earthquake rocked the city of Kobe. A 1998 study by Japanese and Danish researchers looked at live births nine months after the disaster and found a "prominent decline" in the ratio of male births.

**Denmark.** A nationwide study of women who experienced severe emotional stress before or during a pregnancy found that the frequency of malformations like cleft palate and cleft was higher in pregnancies with exposure to severe life events.

— Peggy O'Crowley

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Some of the birth defects that researchers are looking for include cleft palate, cleft lip, congenital heart disease and neural tube defects such as spina bifida because those are particularly linked to stress, Lambert said. Scientists theorize the defects are caused by production of cortisone, a stress hormone that has been shown to produce cleft palate when administered to pregnant mice.

Theories why women give birth to more girls are less advanced. One idea is that Y-chromosome sperm are less mobile under stress; another is that, for an unknown reason, male embryos fail to implant on the uterus as frequently as female embryos, Lambert said. The normal sex ratio is 106 boys to every 100 girls.

The study, which received more

than \$500,000 in funding from the National Institutes of Environmental Health Science, is expected to be finished by next summer.

The study may find no connections between the disaster and birth irregularities. But if it does, said Lambert, the findings could help obstetricians and others find ways to help pregnant women lower their stress levels during times of crisis.



MIA SONG/THE STAR-LEDGER

Lab technician Brooke Hodes examines World Trade Center dust samples that are part of a study by the Center for Childhood Neurotoxicology and Exposure Assessment.