

CLIMATE CHANGE

Peruvians Sick of El Niño

As Peruvian officials braced for the effects of El Niño in 1997, they suspected they might be hit with a rash of diarrhea cases. They were correct, as the diarrhea caseload in children doubled during the worst stretches of a 16-month period of above-average temperatures. An international team of researchers led by William Checkley, a researcher in the Department of International Health at the Johns Hopkins School of Public Health and a medical student at Northwestern University, has concluded in a study published in the 5 February 2000 issue of *The Lancet* that higher temperatures triggered a diarrhea outbreak in Lima. The study is one of the first to statistically support the long-suspected link between diarrhea and temperature. Diarrhea annually kills about four million people worldwide, mostly children.

The warming effects of El Niño were felt in Lima, a metropolitan area of about eight million people, from May 1997 through August 1998. The team compared selected

data on hospital admissions and climate factors for the El Niño period to comparable data from 1993 to 1996. During the time for which data were reviewed, 57,331 children under age 10 who were suffering from diarrhea of undetermined cause were admitted to the Oral Rehydration Unit of the 600-bed Instituto de Salud del Niño, Lima's largest public hospital for children. The team found that the historical pattern of diarrhea cases in the Southern Hemisphere—higher in summer (January–March) and lower in winter (July–September)—continued during the El Niño period. But hospital admissions jumped about 20% higher than normal during the summer and up to 100% higher during the winter, leading to an estimated 6,225 more cases than normal during the El Niño period. In the peak summer and winter months of 1997–1998, mean ambient temperatures increased up to 5°C (9°F) above normal.

Along with temperature, the team investigated a possible link with humidity, which averages an unusually high 84% in Lima's coastal setting. They found it was inextricably linked with temperature, with falling humidity strongly correlated with rising temperature.

Although the researchers speculated about the greater increase in cases of diarrhea in winter, they could not statistically test their hunches about which biological or behavioral factors may have contributed to the greater winter incidence. The team did inquire about some year-round factors other than climate that may have boosted the diarrhea caseload, which increased 8% for each 1°C (1.8°F) rise in temperature, even in the pre-El Niño years. But local health officials said there had been no changes on their part in preventive or educational efforts, and unpublished community data suggest that people were not seeking treatment at a higher rate.

The team acknowledges that some potential explanations, such as less-conscientious hygiene and changes in patterns of food availability, remain untested. And Lima's climate, where the data were collected, is distinctive enough that the same pattern may not hold up elsewhere. "It's an interesting finding that needs further study before it can be assumed to apply to other locations," says Janice Longstreth, a toxicologist and president of The Institute for Global Risk Research. —**Bob Weinhold**

CHILDREN'S HEALTH

UNICEF Reports on the State of the World's Children

The world's children are born healthier, are better protected against disease, and are educated in higher numbers than in past decades because of concerted international action focusing on the rights of children, according to a new report released by the United Nations Children's Fund (UNICEF). Looking back at recent improvements in children's lives and forward toward new challenges, the report, *The State of the World's Children 2000*, lays the groundwork for a meeting on children's rights planned in conjunction with a special session of the United Nations General Assembly to be held in 2001.

"Humanity has seen stunning advances and has made enormous strides for children," writes author Carol Bellamy, executive director of UNICEF, in the report. Among the gains is an overall decrease in mortality of children below the age of five. Through extensive vaccination, polio and smallpox have been nearly eradicated and measles has been reduced by 85%. Neonatal tetanus, a major cause of infant mortality, is down more than 25%. Providing vitamin A supplements to at-risk children has reduced blindness, and iodine supplements have lowered the incidence of mental retardation. More children are currently in school than at any other time in history.

Still, critical challenges remain, according to Bellamy. "The world has more children living in poverty than it did 10 years ago," she points out in the report. Furthermore, although mortality in early childhood has decreased throughout much of the world, some regions are seeing declines in overall expected life span, dropping to pre-1960 levels in the areas hardest hit by HIV and AIDS. The AIDS pandemic has had a double impact on children, both infecting them and destabilizing their lives by turning many into orphans. War, violence, and natural disasters in the last decade have also made the world more dangerous for children, according to the report. Wars

between poor nations have increasingly included children as both soldiers and civilian targets.

Social stratification also affects children's lives. Despite academic gains for children in general, girls around the world continue to be educated less than boys. According to Donna Petersen, an associate professor of maternal and child health at the University of Alabama at Birmingham School of Public Health, this is especially problematic because women usually make the health care and economic decisions in families. "If they don't read," she says, "it's that much harder to get the word out to families about issues that impact their health."

The UNICEF report touches only lightly on environmental issues. This is an important oversight, suggests Devra Davis, a senior scientist at the World Resources Institute. "Unlike a lot of things that affect children's health, the environment is something we can do something about directly," she says. Improving disease control, education, and childhood mortality were

among the goals of children's rights initiatives set out a decade ago by the United Nations' 1989 Convention on the Rights of the Child and the 1990 World Summit for Children. Rather than moving on from immunization and nutrition to sanitation and environmental improvement, which were also highlighted in the earlier initiatives, the current report focuses on complex, entrenched social factors such as poverty, war, discrimination against women, and the growing gap between the rich and poor as central problems that must be addressed to improve the lives of children. "Intergenerational patterns of poverty, violence and conflict, discrimination, and disease are not unconquerable," writes Bellamy. "What's more, given the resources the world has at hand, these deadly cycles can be broken within a single generation." The report calls on governments, communities, the private sector, families, and individuals to provide leadership in these areas, and sets the stage for addressing these issues at the planned 2001 meeting.

The State of the World's Children 2000, which was released 13 December 1999, is available on the UNICEF Web site located at <http://www.unicef.org/>. —**Victoria McGovern**



United Nations Children's Fund