

Economist examines costs of extreme cold weather

Fatalities in the continental United States tend to climb for several weeks after severe cold spells, ultimately numbering 360 per chilly day and 14,380 per year, according to a new study co-authored by a University of California, Berkeley, economist.

Deaths linked to extreme cold account for 0.8 percent of the nation's annual death rate and outnumber those attributed to leukemia, murder and chronic liver disease combined, the study reports. Cold-related deaths also reduce the average life expectancy of Americans by at least a decade, it says.

The numbers are "remarkably large," said Enrico Moretti, a UC Berkeley associate professor of economics, and Oliver Deschenes, an associate professor of economics at UC Santa Barbara, in a December 2007 working paper, "Extreme Weather Events, Mortality and Migration."

The study also says that demographic shifts from colder climes to warmer ones - for reasons such as better jobs, cheaper housing and sunshine - appear to delay an estimated 4,600 deaths a year. The researchers also said that over the past 30 years, longevity gains associated with geographic mobility accounted for between 4 and 7 percent of the increases in life expectancy in the United States.

In research conducted for the National Bureau of Economic Research, the economists looked at immediate and longer-term death rates after at least 24 hours at temperatures between 10 and 20 Fahrenheit degrees below normal - and those over 80 or 90 degrees Fahrenheit - for the county and the month observed.

They offer new evidence of the role of extreme weather in understanding the underlying causes of a steadily improving average lifespan in the United States and provide insights for policy makers charged with allocating financial and other resources following often headline-grabbing heat or freezing weather.

The establishment, at often great expense, of "cooling centers" and the mobilization of emergency personnel in major cities in advance of or after heat waves doesn't seem to serve much purpose beyond alleviating mild discomfort, said Moretti.

Likewise, he said, there seem to be few immediate options for helping those most at risk deal with cold weather dangers: "A lifetime of deprivation is hard to counteract in the short run."

Noting increasing concern that higher temperatures and incidence of extreme weather events caused by global warming could create major public health problems, the economists said they relied on actual, recorded data and avoided hypothetical possibilities.

Among their key findings:

- Women account for two-thirds of deaths following a period of severe cold, although it is unclear why.
- Infants and males living in low-income areas also are at high risk of dying after a cold spell.
- The death rate declines dramatically after scorching temperatures subside, while deaths after cold spells continue to increase for weeks.
- Death rates do not escalate after cold snaps that occur when the price of oil is high.
- Cardiovascular and respiratory diseases are the top causes of death for those who die following severe hot or cold weather.

-- Not surprisingly, those hardest hit by both heat and cold waves are adults 75 years of age or older, many who were already physically vulnerable and who would likely have died even in the absence of the temperature shocks.

-- U.S. mortality rates peak in December and January and are at their lowest points from mid-July to mid-August.

Cities recording the biggest numbers of cold weather-related deaths include Chicago, Detroit, Minneapolis and Cleveland, according to Moretti and Deschenes. They estimated that 1.4 percent to 3.2 percent of the annual deaths in those cities could be delayed if people reduced their exposure to extremely cold weather.

The researchers acknowledged the geographic differences among the nation's 20 largest metropolitan statistical areas that were included in their study. For example, residents of San Diego, Los Angeles, Fort Lauderdale and Phoenix recorded no bouts of extreme cold, while Philadelphians faced 31 cold days a year on average, New Yorkers 36, Bostonians 50, Chicagoans 57, Detroit residents 69, and Minneapolis residents 109.

For the 1972 to 1988 time frame examined, researchers reported that the Chicago area recorded 542 deaths per 100,000 people in the 65-plus age group per day of severe cold, followed by Minneapolis with 448 and Detroit with 426. For the 20 urban areas studied, the economists said that 3,054 deaths theoretically could have been delayed by moving the individuals to warmer climates.

Moretti and Deschenes said that evidence suggests that people can get acclimatized to the cold. The recorded death rate was substantially larger in countries where people were exposed to 10 or fewer cold days a year and lower in counties that have at least 90 cold days a year, they said.

They noted that between 1970 and 2000, the average age of death among the U.S. white population increased 8.1 years for females and 6.3 years for males. They examined all U.S.-born individuals who during the study period lived in a county other than where they were born, and compared the weather exposure in the individuals' home states with that of the county where they died.

Data for the extreme weather study came from the U.S. Multiple Causes of Death files and included the cause, date and age of death, the county where the death occurred in the continental U.S., and the sex of the person who died.

The researchers drew on population totals for 2,279 counties by age groups to calculate daily mortality rates and included daily temperature and precipitation information from the National Climatic Data Center's 24,833 weather stations operating during the sample period.

Their report is online at: http://www.econ.berkeley.edu/~moretti/weather_mortality

Source: UC Berkeley

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