

The Big Question: What was Roosevelt's New Deal, and is something like it needed today?

Pollution can make you fat, study claims

Children exposed to pesticide in womb twice as likely to be overweight, refuting idea of sole personal responsibility. Geoffrey Lean reports

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Pollution can make children fat, startling new research shows. A groundbreaking Spanish study indicates that exposure to a range of common chemicals before birth sets up a baby to grow up stout, thus helping to drive the worldwide obesity epidemic.

The results of the study, just published – the first to link chemical contamination in the womb with one of the developing world's greatest and fastest-growing health crises – carry huge potential implications for public policy around the globe. They undermine recent strictures from the Conservative leader, David Cameron, that blame solely the obese for their own condition.

A quarter of all British adults and a fifth of children are obese – four times as many as 30 years ago. And so are at least 300 million people worldwide. The main explanation is that they are consuming more calories than they burn. But there is growing evidence that diet and lack of exercise, though critical, cannot alone explain the rapid growth of the epidemic.

It has long been known that genetics give people different metabolisms, making some gain weight more easily than others. But the new study by scientists at Barcelona's Municipal Institute of Medical Research suggests that pollution may similarly predispose people to get fat.

The research, published in the current issue of the journal *Acta Paediatrica*, measured levels of hexachlorobenzene (HCB), a pesticide, in the umbilical cords of 403 children born on the Spanish island of Menorca, from before birth. It found that those with the highest levels were twice as likely to be obese when they reached the age of six and a half.

HCB, which was mainly used to treat seeds, has been banned internationally since the children were born, but its persistence ensures that it remains in the environment and gets into food.

The importance of the study is not so much in identifying one chemical, as in showing what is likely to be happening as a result of contact with many of them. Its authors call for exposures to similar pesticides to be "minimised".

Experiments have shown that many chemicals fed to pregnant animals cause their offspring to grow up obese. These include organotins, long employed in antifouling paints on ships and now widely found in fish; bisphenol A (BPA), used in baby bottles and to line cans of food, among countless other applications; and phthalates, found in cosmetics, shampoos, plastics to wrap food, and in a host of other everyday products.

These pollutants – dubbed "obesogens" as a result of these findings – are so ubiquitous that almost everyone now

has them in their bodies. Ninety-five per cent of Americans excrete BPA in their urine; 90 per cent of babies have been found to be exposed to phthalates in the womb; and every umbilical cord analysed in the new Spanish study was found to contain organochlorine pesticides such as HCB.

Two American studies have implicated phthalates in obesity in adult men, but the new research is much more conclusive, and is the first to show the effects of exposure in the womb, where humans are most vulnerable.

Dr Pete Myers, one of the world's leading experts on obesogens, told The Independent on Sunday last night: "This is very important. It is the first good study of the effects on the foetus. Its conclusions are not surprising, given what we know from the animal experiments, but it firmly links such chemicals to the biggest challenge facing public health today."

No one knows how HCB causes obesity. The Spanish scientists speculate that it may have made the mothers diabetic, which would increase the chances of their children becoming obese (see graphic, above).

Dr Myers, who is chief scientist at the US-based Environmental Health Sciences, which helps to increase public understanding of emerging scientific links, says this is "plausible", but adds that the animal experiments point elsewhere. These have shown that obesogens "switch genes on and off" in the womb, causing stem cells to be turned into fat cells. The children then grow up with a much greater disposition to store and accumulate fat.

Whatever the explanation, the research goes some way to undermining David Cameron's assertion in a speech this summer that obesity is purely a matter of "personal responsibility", a view echoed by his health spokesman, Andrew Lansley 10 days ago. The Tory leader said that the obese are "people who eat too much and take too little exercise".

Dr Myers calls that "wishful ideological thinking which does not accord with biological reality", adding: "We need to discover ways to reduce exposures to these chemicals so that changing diet and lifestyle has a chance to work."

Factors that may pile on the pounds

Why is the world getting so fat? Everyone agrees that people gain weight by taking in more calories in their food than they burn off through everyday activities and exercise. But many scientists are coming to believe that changes in diet and exercise do not sufficiently explain the rapid growth of the epidemic. As 'The Independent on Sunday' reported last week, there has been no reduction in physical activity in Britain since 1980, while obesity rates have quadrupled.

The genetic make-up of a population does not change rapidly enough to provide an explanation. So the hunt is on for other factors that might show why more people are gaining weight more easily.

Life before birth. Both overweight and underweight babies are more likely to grow up fat. So are those born to smokers. Evidence suggests pollution is also predisposing the unborn to obesity. The introduction and increase in the use of such chemicals coincides with the epidemic taking off.

Age of mothers. The chances of becoming obese increase with maternal age. And the average age of first giving birth has gone up by 2.6 years in Britain since 1970.

Less sleep. Both children and adults are more likely to get fat if they get too little sleep, partly because they become hungrier. Average daily sleep has fallen from nine to seven hours over recent decades.

Temperature. People burn up more calories when they are cold. Central heating has ensured that they spend most

of their time in comfortable temperatures.

Prescription drugs. Some drugs – including anti-psychotics, antidepressants and treatments for diabetes – cause people to gain weight.

Stopping smoking. Though mothers who smoke may make their children fat, they – and all smokers – are themselves less likely to put on weight. As the habit has decreased, obesity has soared.

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