EPA Accelerates Ban on Leaded Gas

After a long hard-fought battle, the Environmental Protection Agency (EPA) on 4 March announced new restrictions on the use of lead in gasoline. It ordered refiners to remove 90 percent of the lead currently used as an antiknock additive by the end of the year. This reduction, which was first proposed in August last year, was widely anticipated.

Unexpectedly, however, EPA went one step further by proposing to accelerate the date when lead would be banned from gasoline entirely. The agency had earlier proposed a ban by 1995; it now wants to stop the use of lead 7 years sooner, by 1988.

Agency officials say that the new proposal was prompted by two studies that show a strong statistical correlation between low amounts of lead and high blood pressure in adults, particularly white males. Until now, public health officials have been primarily concerned about reducing children's exposure to lead, which at low levels can cause brain damage and other neurological problems. EPA estimates, for example, that removal of 90 percent of the lead in gasoline will prevent lead-linked illness in 172,000 children. But low levels of lead may be a health threat to adults, too, according to the two new studies, which were published this year.

The decision to reduce lead use by 90 percent will go into effect automatically unless it is challenged in court. The proposal to ban lead from gasoline entirely by 1988, along with the two studies on which it is based, are currently open for public comment. Epidemiological studies of this sort are often difficult to interpret and are read differently by different scientists. It is not yet clear whether the decision will be challenged on scientific grounds. However, Joel Schwartz, a policy analyst at EPA, says that the agency's plan to speed up the ban may be challenged by lead producers. Although a ban in the U.S. will not significantly affect their sales here, he said, such an action would put pressure on European countries to follow suit. Most European countries have yet to institute any major restrictions on lead content in gasoline.

The researchers involved in both studies analyzed the same data base, a national health and nutrition survey conducted from 1976 to 1980 called the National Health and Nutrition Examination Survey II. In the carefully designed survey, more than 20,000 individuals, chosen as a representative sample of the U.S. population, underwent medical testing to evaluate blood pressure, blood chemistry, and heart condition. They also were interviewed extensively about their diets and their medical histories. EPA reports that previous statistical studies have shown that about half the blood lead in the people surveyed came from gasoline.

The two research groups used similar statistical methods but looked at different populations. The methods used allowed researchers to look at a variety of variables and to pinpoint which ones have significant effects on blood pressure. The first study, which was led by University of Michigan researchers William R. Harlan and J. Richard Landis and published in the 25 January issue of the *Journal of the American Medical Association*, looked at a broad group ranging from 12 to 74 years of age, and included men and women, blacks and whites. The investigators concluded that blood lead levels were "significantly higher" for men and women 21 to 55 years old. When other factors were considered, such as body weight, age, and race, the link between high blood pressure and lead held for men but not for women. Previous studies have also found that blood lead levels were lower on average for women than men, but the reasons for this are as yet physiologically and environmentally unexplained.

The second study looked at a subset of the first study and focused on white males 40 to 59 years old. The researchers selected a narrower age range because age itself has a small influence on blood pressure. Limiting the study to white males also eliminated sex and race as complicating factors. Again, researchers found that lead was a "probable" cause of high blood pressure in this group. Harlan and Landis also collaborated with this study, but the principal investigators were James Pirkle of the Centers for Disease Control and Schwartz of EPA. The study was published in the February issue of the *American Journal of Epidemiology*.

The Pirkle group first calculated whether blood lead was related to blood pressure after controlling for body weight and found a strong correlation. Then, to tell whether other variables changed this relationship, 87 other factors were considered individually and in combination. These included many nutritional and biochemical factors, exercise, family history of hypertension, and whether the person lived in an urban or rural area. Again, the researchers found a strong association between blood lead levels and hypertension. As a final test, all variables except blood lead were calculated for their association with blood pressure, and then blood lead was factored in. Lead still remained linked to elevated blood pressure.

According to EPA's background document proposing to ban lead, the results from the two investigations are supported by previous epidemiological and animal studies, but they rely on a far greater base of information than previous research.

Using the findings of the Pirkle study, EPA estimates that its ruling to cut back lead in gas will reduce cardiovascular disease among white males and probably black males, too. (The estimates were based only on white males because existing studies on nonwhites are insufficiently large, the EPA document says.) The agency projects that a 90 percent reduction in the use of lead in gasoline may prevent 1.8 million cases of high blood pressure and reduce the number of heart attacks in 1986 by 5000 and the number of strokes by 1000. A ban would increase these public health benefits, according to Schwartz. For now, however, the EPA document says, these estimates "should be treated as preliminary."

Even without the new findings, EPA argues that a 90 percent reduction is supported by a cost-benefit analysis. According to its estimates, American consumers in 1986 will as a whole save $914 million on car engine maintenance, $187 million on fuel economy, and $600 million in health costs associated with toxic effects in children, which amounts to a grand total of $1701 million. The total cost of lead in gasoline is $608 million.

—MARJORIE SUN