

Blood Lead Levels - NHANES II Study

Geometric Means of Measured Values - Not Weighted

<u>6-Month Period Ending</u>	<u>ug Pb/dl</u>	
	<u>Urban</u>	<u>Semi-Rural and Rural</u>
6-76	15.4	15.1
12-76	16.2	15.0
6-77	14.6	11.2
12-77	14.4	13.3
6-78	13.7	12.8
12-78	15.6	13.1
6-79	14.0	11.1
12-79	11.8	10.1
2-80	-	9.9

The blood lead levels of persons living in the urban areas (over one million population) declined less over the period than those living in rural and semi-rural areas (less than 10,000 population). However, it is logical to assume that the amount of lead used per unit area is greater in the urban areas as is the air lead concentration and the amount of lead in dust and soil. If the downward trend in blood lead levels shown in the above table were due solely to the decreasing use of lead in gasoline, then blood lead levels in the urban group should have declined more than in the rural group. The reverse was found.

In a German study (1), blood lead levels of about 300 adults in Frankfurt were measured before and after the gasoline lead level was reduced 62% from 1.55 g Pb/gallon to 0.58 g Pb/gallon. Blood lead levels decreased about 10% or about 1.5 to 2.0 ug Pb/dl. These results are much different than the NHANES II results where a decrease of 37% (5.8 ug Pb/dl) in the blood was observed while lead use in gasoline was reduced 56%. The Frankfurt results agree with other studies which have indicated a change of 1 ug Pb/m³ in airborne lead to produce a change of 1-2 ug Pb/dl in blood lead. Indeed, it was these studies on which EPA relied in establishing the 1:2 air lead-blood lead relation used in developing the air lead standard.

While the NHANES II study is not demonstrably free of possible difficulties relating to quality control at all stages of the blood sampling and analysis process and in the timing and location of sampling over the period, a downward trend in blood lead levels is not unexpected. Although a unique causal relation with gasoline lead use is not likely and cannot be demonstrated, gasoline lead use did decline and a number of other programs to reduce lead exposure were in operation.