ECONOMIC IMPACT OF CHILDHOOD LEAD POISONING

Childhood lead poisoning is a major, preventable environmental health problem, which may cause developmental problems, lower IQ, behavioral problems, attention deficit disorder, learning problems, language delay, anemia, damage to the nervous system and, rarely, death, particularly in children less than 6 years of age. Furthermore, this public health problem also results in billions of dollars in health care costs to taxpayers and the government. It has been estimated that the economic impact of childhood lead poisoning accounts for $43.4 billion annually. Gould has estimated that loss of IQ points from elevated blood lead levels (EBLLs) falls between 9.3 and 13.1 million points, which results in a total lifetime earnings loss of $165-233 billion, far exceeding the $10.8-$53.1 million in direct health care costs.

Health Care Costs

In Oklahoma during 2009, there were 137 newly diagnosed (incident) EBLL cases. The additional cost of follow-up testing, case management, and medical management of these children was $35,291. This cost was calculated based on Kemper et al.’s cost estimates, which were inflated to 2009 USD using the Consumer Price Index (CPI) Inflation Calculator.

IQ and Total Lifetime Earnings Loss

Several scientific studies have suggested a strong association between EBLLs and reduction in IQ. On the basis of Schwartz et al.’s estimates, one of the most commonly used estimates, each microgram per deciliter of blood lead level is associated with a loss of 0.257 IQ points. Based on the average blood lead level of 16.2 \( \mu g/dL \) for 137 EBLL children in Oklahoma during 2009, the estimated IQ loss was 4.2 points per EBLL child. Gould estimated that each IQ point loss is associated with a loss of $17,815 (in 2006 USD). Inflating this amount to 2009 USD ($18,958) and using the previously calculated IQ loss of 4.2 points per EBLL child, it can be estimated that Oklahoma will lose approximately $11 million from lifetime earnings being reduced of 137 children with an EBLL in 2009.

Special Education

EBLL children with learning and behavioral problems are often in need of special education. Schwartz et al estimated that 20 percent of children with an EBLL above 25 \( \mu g/dL \) need special education, such as assistance from a reading teacher, psychologist or other specialist, for an average of three years. During 2009, there were 15 children in Oklahoma with EBLL above 25 \( \mu g/dL \). Korfmacher estimated that the average annual cost of special education
education was $12,833 (in 1998 USD).\textsuperscript{8} Inflating this amount to 2009 USD ($16,891), it can be estimated that average cost of special education for three years will be $50,673 per child or $152,019 for three children (20 percent of 15 EBLL children) with an EBLL in 2009.

**Juvenile Offences**

Studies have suggested that lead poisoning may result in delinquent behavior and future violent crimes.\textsuperscript{9,10} Korfmacher estimated that 10 percent of juvenile delinquency may be attributed to lead poisoning.\textsuperscript{8} The U.S. Office of Juvenile Justice and Delinquency Prevention (OJJDP) estimates that the annual cost of incarcerating a youth is $34,000.\textsuperscript{11} According to the Oklahoma Office of Juvenile Affairs, there were 641 violent juvenile offenders placed in custody or on probation during fiscal year 2008. Using the OJJDP estimates, the assumption can be made that the cost of violent juvenile offences attributable to lead poisoning in Oklahoma could be approximately $2,176,000 in 2009.

**Summary**

Based on the above conservative estimates, childhood lead poisoning in Oklahoma during 2009 alone could have cost the state and taxpayers approximately $13.3 million in direct health care, special education, and juvenile delinquency costs as well as total lifetime earnings loss.
It is important to note that the state data are collected on convenience samples and not representative samples and, therefore, are likely to underestimate the true incidence of childhood lead poisoning and the direct healthcare costs associated with it. Long-term healthcare costs associated with possible adverse effects on nervous, cardiovascular, and renal systems attributable to EBLLs have not been calculated here. Additionally, recent research shows adverse health effects of childhood lead poisoning at much lower levels. As a result, children with levels below 25 μg/dl may also need special education, therefore increasing the cost of special education attributable to lead poisoning. Last, cost of non-violent juvenile offences presumably due to lead poisoning has not been calculated here.

Given the high cost of childhood lead poisoning, measures such as investing in making high risk homes lead safe by reducing lead hazards and periodic monitoring of blood lead levels of children living in these homes appear to be significantly cost beneficial.

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REFERENCES


**The Whittington Lounge**

On May 11, as part of the celebration of National Hospital Week, Deaconess Hospital named the physicians’ lounge the Ken Whittington, MD Physicians’ Lounge in recognition of his dedication to the hospital and medical staff. His family, friends and many physicians gathered early in the morning to surprise him as he was brought into the lounge completely unaware of what was taking place. His first comment, “Did I die?,” was a “Whittington” comment and brought a roar of laughter. A breakfast reception followed with many physicians and friends coming by to give their congratulations.